Geology, Exploration and Mining in British Columbia

1972

British Columbia Department of Mines and Petroleum Resources

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INTRODUCTION

The first Minister of Mines of the Province of British Columbia was appointed in 1874. One of his responsibilities was "the duty of collecting information on the subject of the mining industries of the Province." This material, which consisted of reports by the Gold Commissioners and Mining Recorders of the Province, was published in the Annual Report of the Minister of Mines.

A Bureau of Mines was established by Parliamentary authority in 1895 and in 1896 was staffed by a Provincial Mineralogist and an assayer and chemist. Technical reports on mines and mining activities were prepared by them and published in the Annual Report, together with reports contributed by the Mining Recorders and Gold Commissioners.

Over the years with the expansion of the mining industry, the staff of the Department of Mines grew, as did the number and size of the technical reports on geology and mining that were still published in the Annual Report of the Minister of Mines. Over a period of nearly 75 years the Annual Report became known as the authoritative record of mining in the Province.

However, in 1969, because of the size to which the Annual Report had grown, it was decided to publish all geological and technical reports on Metal Mining and Exploration, Placer, Structural Materials and Industrial Minerals, and Coal Mining and Exploration in a separate volume entitled *Geology, Exploration, and Mining in British Columbia*. Thus a new annual publication was initiated which, as a separate entity from the Annual Report, exists for the purpose of publishing geological and technical reports and of recording the exploration activity in the Province.

Each year the Annual Report of the Minister of Mines and Petroleum Resources is also published. It contains a general review of the mineral industry and chapters on Statistics, Departmental Work, Petroleum and Natural Gas, and Inspection of Mines.

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METAL MINES

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GENERAL REVIEW OF EXPLORATION AND METAL MINING

By Stuart S. Holland

PRODUCTION

The outstanding feature of 1972 was the enormous increase in copper production derived from six new mines which came into production during the year. This represents the end of a cycle of vigorous exploration for porphyry copper deposits that started in the mid 1960's. Exploration reached a maximum in 1970, mine development peaked in 1971, and in 1972 the last major projects were brought into production. As a consequence of their completion, metal production in British Columbia reached a new record of $372,995,661 in 1972, an increase of $71,935,710 or 23.9 per cent more than the $301,059,951 produced in 1971. The main increase was in copper but there were important increases in production of molybdenum, gold, and nickel, and small increases in antimony, cobalt, tin, and placer gold.

METAL PRODUCTION OF BRITISH COLUMBIA, 1972

		1971		1972	
		Quantity	Value $	Quantity	Value $
Antimony	lb.	323,525	243,614	679,601	419,042
Bismuth	lb.	82,521	388,674	93,820	324,617
Cadmium	lb.	1,036,713	2,011,223	695,650	1,759,995
Cobalt	lb.	113,545	103,099	155,739	155,739
Copper	lb.	280,619,150	131,037,918	467,012,694	209,403,822
Gold, placer	oz.	177	4,647	691	26,905
Gold, lode	oz.	85,781	3,031,844	121,624	6,995,448
Iron concentrates	tons	1,929,868	18,153,612	1,256,308	12,604,409
Lead	lb.	246,287,301	34,711,408	194,249,571	28,896,566
Molybdenum	lb.	21,884,729	36,954,846	28,041,603	43,261,210
Nickel	lb.	2,543,578	3,497,420	3,240,483	4,601,486
Silver	oz.	7,673,546	11,968,046	6,926,036	11,519,660
Tin	lb.	318,999	421,079	351,043	473,908
Tungsten (WO_3)	lb.	1,335,808	3,012,540	1,273,196	2,167,663
Zinc	lb.	305,451,243	49,745,789	268,347,996	47,172,894
Others			5,774,192		3,212,297
TOTALS			301,059,951		372,995,661

Gold production increased in both quantity and value, the increase in quantity being a by-product to the increased copper production. The average price per fine ounce of gold increased from $35.34 in 1971 to $57.52 in 1972. As a result small-scale placer mining was stimulated and there was a small increase in production of placer gold.

During the year, the average price of silver increased from $1.56 in 1971 to $1.66 in 1972. Notwithstanding, the production of silver declined by 747,510 ounces and by $448,386, mainly because of declines in silver production at Sullivan, Silmonac, Bluebell, Lynx, and Annex mines.

The average price of copper continued to decline during 1972 dropping from 46.7 cents per pound in 1971 to 44.8 cents in 1972. Copper production again increased significantly in quantity by 186,393,544 pounds or 66.4 per cent and by $78,365,904 or 59.8 per cent in value. At $209,403,822, it is the most valuable metal produced in the Province.

The gain in copper production was due to the new production from the Gibraltar, Lornex, Similkameen (Ingerbelle), Bell (Newman), Sunro, and OK (Alwin) mines which opened during the year; from Island Copper and Bull River mines which had been operating for a full year at near capacity; and from increased concentrator capacity at Granisle mine. In 1973 copper production is estimated at 700,000,000 pounds, a further increase of 50 per cent.

During 1972, the average price of lead increased from 13.95 cents per pound to 14.88 cents. Production of lead was down both in quantity and in value, largely through decreased production at Sullivan, Silmonac, and Annex mines and closure in 1971 of the Bluebell and Ruth Vermont mines.

The average price per pound of zinc declined from 16.29 cents to 15.58 cents. Decreased production of zinc combined with the lower price resulted in the value of production being down to $47,172,894.

Production of iron concentrates mainly from Tasu and Texada mines was down by about one third because of dock strikes in Japan.

Molybdenum, the third most important metallic product, increased both in quantity and value, from $36.95 million in 1971 to $43.26 million in 1972 because of concentrate sales which improved significantly during the latter part of the year.

Tungsten production from the Invincible mine near Salmo was down somewhat from 1971 because of weak demand and lower price.

PROVINCIAL REVENUE FROM MINING COMPANIES

Direct revenue to the Provincial Government derived in 1972 from the mining sector of the mineral industry was as follows:

Free miners' certificates, recording fees, lease rentals, assessment payments, etc.	$1,785,526.49
Royalties on iron concentrates	145,225.35
Rentals and royalties on industrial minerals and structural materials	520,446.90
Fifteen per cent mining tax (received during 1972)	5,686,845.43
Coal licences	184,444.95
TOTAL	$8,322,489.12

EXPENDITURE BY MINING COMPANIES

Major expenditures in 1972 by companies involved in the exploration, development, and mining of metals, minerals, and coal were as follows:

Capital expenditures	$100,757,109	
Exploration and development	68,565,506	169,322,615
Mining operations (metals, minerals, coal)		240,667,327
Mining operations (structural materials)		19,581,875
Repair expenditures		61,087,020
TOTAL		$490,658,837

MINING

In 1972, 62,522,663 tons of ore from 41 mines was mined and subsequently concentrated or shipped to smelter. This represents an increase in tonnage of about 47 per cent over 1971. Thirteen mines produced more than one million tons each of which nine were open-pit mines and twelve mines produced between 100,000 and one million tons each of which six were open-pit mines. The fifteen open-pit mines produced 53.078 million tons of ore or almost 85 per cent of the total tonnage of ore mines.

During the year, the following mines were brought into production:

Lornex and OK (Alwin) copper mines in Highland Valley.
Similkameen (Ingerbelle) copper mine at Princeton.
Gibraltar copper mine at McLeese Lake.
Bell (Newman) copper mine on Newman Peninsula on Babine Lake.
Sunro copper mine at Jordan River.
Nadina silver-lead-zinc mine at Owen Lake south of Houston.

During the year, the following mines closed:

British Columbia Molybdenum mine (British Columbia Molybdenum Ltd.) at Alice Arm.
OK (Alwin) mine (OK Syndicate) in Highland Valley.
Old Sport mine (Coast Copper Company Limited) at Benson Lake, Vancouver Island.

CONCENTRATING

In 1972, 34 concentrators were in operation: thirteen treated copper ore, three treated copper-iron ore, two treated copper-molybdenum ore, five treated molybdenum ore, one treated nickel-copper ore, two treated copper-lead-zinc ore, six treated silver-lead-zinc ore, one treated tungsten ore, and one treated mercury ore.

Construction of concentrators was completed during the year at the following mines:

OK (Alwin) mine, Highland Valley, 600 tons per day.
Bell (Newman) mine, Babine Lake, 10,000 tons per day.
Gibraltar mine, McLeese Lake, 30,000 tons per day.
Lornex mine, Highland Valley, 38,000 tons per day.
Silver Queen (Nadina) mine, Owen Lake, 500 tons per day.
Similkameen (Ingerbelle) mine, Princeton, 15,000 tons per day.
Sunro mine, Jordan River, 1,500 tons per day.

Late in 1972, the enlargement of the Granisle concentrator was completed from 6,500 tons per day to 14,000 tons per day.

SMELTING

The only base-metal smelter in operation in the Province is owned and operated by Cominco Ltd. at Trail. From mines in British Columbia, it received 142,048 tons of lead concentrates and 182,848 tons of zinc concentrates. The company's own mine, the Sullivan, contributed 136,085 tons of lead concentrates and 180,050 tons of zinc concentrates. Other mines in British Columbia contributed 5,963 tons of lead concentrates, 2,798 tons of zinc concentrates, and 1,116 tons of crude ore, all of which was treated on a custom basis. In addition, the smelter also treated a large tonnage of ore, concentrates, and scrap from sources outside the Province; the company's Pine Point mine on Great Slave Lake was a large contributor.

Products exported to American smelters were: copper concentrates, 33,964 tons; lead concentrates, 2,966 tons; zinc concentrates, 43,141 tons; iron concentrates, 169,191 tons; and tungsten concentrates, 511 tons. The value of these products was $21.2 million. It represents about 5.7 per cent of the value of the 1972 metal production of the Province.

Products exported to Japanese smelters were:copper concentrates, 761,284 tons; nickel-copper concentrates, 18,994 tons; iron concentrates, 985,533 tons; zinc concentrates, 12,159 tons; and tungsten concentrates, 202 tons. The value of these products was $211.6 million, an increase of $60.5 million from 1971. It represents about 56.7 per cent of the 1972 metal production of the Province.

During the year, the iron smelter operated by Cominco Ltd. at Kimberley was closed.

DEVELOPMENT

Statistical returns from mining companies indicate that in 1972, $65,716,249 was spent by companies in preproduction development of metalliferous mines, concentrator construction, and the provision of power and transportation facilities. This is a very large decrease from the $232,147,526 spent in 1971.

During the year, preproduction mine development and/or concentrator construction were being undertaken by the following companies:

Alwin Mining Co. Ltd., OK (Alwin) mine.
Dison Development Ltd., Sunro mine.
Lornex Mining Corporation Ltd., Lornex mine.
Noranda Mines, Limited, Bell Copper Division, Bell (Newman) mine.
Gibraltar Mines Ltd., Gibraltar mine.
Nadina Explorations Limited, Silver Queen (Nadina) mine.

EXPLORATION AND PROSPECTING

A comparison of prospecting and exploration activities in 1972 with those of previous years is shown by the following tabulated statistics:

	1968	1969	1970	1971	1972	Change per cent
Exploration cost	$35,000,000	$37,500,000	$46,350,000	$39,050,000	$38,210,000	– 2.2
No. of properties	429	511	566	501	582	+16
Claims recorded	80,384	84,665	69,546	57,778	78,901	+36.5
Certificates of work	66,229	88,954	118,633	106,704	97,573	– 8.5
Free miners' certificates						
Individual	9,305	9,880	10,034	9,351	9,032	– 3.4
Companies	761	1,060	911	930	927	– 0.3

Although the amount of money spent on exploration in 1972 was down slightly from the previous year, it is evident that more properties were worked and that more claims were held.

Recording of mineral claims was most active in the Kamloops, Liard, and Omineca Mining Divisions. The discovery, in 1971, of zinc-lead mineralization at Robb Lake resulted in the locating of a large number of mineral claims along the eastern margin of the Rocky Mountains in the Omineca Mining Division; intensive claim locating activity resulted from the discovery of copper mineralization in fragmental volcanic rocks at the head of the Sustut River; and renewed interest in the area of the Iron Mask batholith west of Kamloops resulted from the favourable exploration of the Afton orebody. The number of claims recorded in 1972 was 78,901, a 35.6-per-cent increase over the previous year.

About 576 geological, geochemical, and geophysical reports were accepted in 1972 by the Department for assessment-work credit. They represent not less than $4.1 million in work done on claims.

Information provided by exploration companies to the Department on questionnaires mailed to them yearly is vital to the production of this volume. This information is the basis of much of the text and is the only way the Department can attempt to provide reasonably complete coverage of activities. The information is summarized in the following table.

Mining Division	Number of Properties	Type of Work								
							Drilling			
					Physical					
		Geological Mapping	Geophysical Surveys	Geochemical Surveys	Surface	Underground	Surface Diamond Drilling (Ft.)	Underground Diamond Drilling (Ft.)	Rotary (Ft.)	Percussion (Ft.)
Alberni	21	13	7	11	10	----	8,790	....	....	....
Atlin	13	10	6	8	4	----	9,922	....	....	....
Cariboo	23	8	9	10	10	----	9,014	....	2,018	5,715
Clinton	20	12	9	8	9	----	3,568	....	106	7,387
Fort Steele	17	7	11	8	3	----	4,246	....	....	....
Golden	13	6	3	7	9	----	1,780	....	....	....
Greenwood	9	2	2	2	4	----	5,952	....	....	6,620
Kamloops	119	75	63	69	33	2	125,280	1,545	18,973	87,894
Liard	56	45	19	40	16	1	66,762	3,872	....	....
Lillooet	9	3	----	5	3	1	1,986	....	....	5,560
Nanaimo	16	13	6	10	6	----	15,384	....	1,000	3,173
Nelson	3	1	2	1	1	----	252	....	....	....
New Westminster	11	5	5	7	5	----	2,922	....	....	....
Nicola	30	14	22	18	5	----	16,101	....	....	19,417
Omineca	126	54	50	66	30	2	76,687	3,856	25	23,244
Osoyoos	11	6	6	3	1	----	5,665	....	312	2,975
Revelstoke	4	2	2	2	1	----	4,318	....	....	....
Similkameen	23	12	12	14	10	1	6,548	530	....	1,150
Skeena	16	7	1	6	11	----	7,027	....	....	1,660
Slocan	12	7	4	4	4	2	1,310	....	45	....
Trail Creek	3	3	----	1	1	2	485	233	....	....
Vancouver	14	7	7	8	5	----	20,178	....	....	....
Vernon	7	2	1	2	4	----	1,535	....	....	....
Victoria	6	2	5	3	3	----	7,596	....	....	....
Totals, 1972	582	316	252	313	188	11	403,308	10,036	22,479	164,795
Totals, 1971	501	254	201	251	153	26	333,653	128,138	3,737	81,934

Comparison with returns for 1971 appears to indicate that the number of active properties increased by about 16 per cent; that the relative amounts of geological, geophysical, and geochemical surveying and surface physical work increased slightly; that underground work and underground diamond drilling decreased substantially; and that other drilling totals increased significantly.

One can only conclude from all the figures that the level of exploration activity was somewhat higher than last year despite there being a very slight reduction in the total amount of money expended.

The number of properties not in production on which major exploration programmes were undertaken was sixteen, one larger than in 1971. Major programmes, namely more than 10,000 feet of drilling or more than 1,000 lineal feet of underground development, were carried out at the following properties (*see* body of the report for details):

Afton at Kamloops.
Berg near Kidprice Lake.
Boss Mountain mine at Takomkane Mountain.
DM, Lorna at Kamloops.
Glacier Gulch on Hudson Bay Mountain.
Homestake at Squaam Bay.
Huckleberry (Len) near Sweeney Lake.
Iron Mask at Kamloops.
JA in Highland Valley.
Joem, Rain at Mount Haskin.
Lorraine near head of Duckling Creek.
Makaoo at Kamloops.
OK at Powell River.
Myra mine at Buttle Lake.
Spectrum at Kakiddi Lake.
Stikine Copper at Galore Creek.

The areal distribution of exploration work on metallic mineral properties in 1972 and 1971 can be compared by referring to the two maps of the Province (Figs. 1 and 2). Development of this type of map is explained in *Western Miner,* April 1972, pages 28 to 30. The percentage figures refer to the number of active properties per unit area but for the purpose here are used to illustrate a gradation of activity.

Comparison of the two figures shows an overall similarity in the two years of the distribution of exploration activity but also shows some definite changes. In 1972 work in northern British Columbia was less dispersed and shows the concentration of activity in the Robb Lake and Sustut River areas, the absence of activity in the Churchill River copper area, the decrease in the vicinity of the Gibraltar mine, as well as the general contraction of areas in the south.

TABLE I – METAL PRODUCTION, 1972

Property or Mine	NTS	Mining Division	Location of Mine	See Page	Owner or Operator	Ore Shipped or Treated	Product Shipped	Gross Metal Contents					
								Gold	Silver	Copper	Lead	Zinc	Cadmium
						Tons		Oz.	Oz.	Lb.	Lb.	Lb.	Lb.
Burnt Basin	82E/1E	Greenwood	Paulson	33	Donna Mines Ltd.	47	Crude ore	–	310	–	7,439	15,737	–
Phoenix mine	82E/2E	Greenwood	Phoenix	36	The Granby Mining Co. Ltd., Phoenix Copper Division	888,266	Copper concentrates, 18,373 tons	15,443	100,419	9,697,007	–	–	–
Highland Bell mine	82E/6E	Greenwood	Beaverdell	42	Teck Corporation Ltd.	37,090	Lead concentrates, 1,308 tons; zinc concentrates, 380 tons; jig concentrates, 182 tons	404	676,046	2,194	535,648	567,446	3,713
Invincible, East Dodger	82F/3E	Nelson	Salmo, Iron Mountain	47	Canex Placer Ltd., Tungsten Division	198,126	Tungsten concentrates, 926 tons containing 1,273,196 lb. of tungsten (WO_3)	–	–	–	–	–	–
Annex	82F/3W	Nelson	Nelway	49	Reeves MacDonald Mines Ltd.	180,188	Lead concentrates, 1,342 tons, zinc concentrates, 22,498 tons	–	284,822	8,432	1,810,108	23,691,787	278,827
Blue Bird	82F/4W	Trail Creek	Rossland	49	Standonray Mines Ltd.	46	Crude ore	13	787	–	5,704	9,575	–
Coxey mine	82F/4W	Trail Creek	Rossland	50	Red Mountain Mines Limited; Consolidated Canadian Faraday Ltd.	*	Molybdenite concentrates, 504,825 tons containing 302,592 lb. of molybdenum	–	–	–	–	–	–
Sullivan mine	82F/11E	Fort Steele	Kimberley	54	Cominco Ltd.	1,925,099	Lead concentrates, 138,085 tons; zinc concentrates, 180,060 tons; tin concentrates, 158 tons containing 351,043 lb. of tin; iron sinter, 44,408 tons	163	3,186,358	593,400	196,083,000	187,196,600	498,582
Ottawa	82F/14W	Slocan	Springer Creek	56	Pamicon Developments Ltd.	81	Crude ore	–	29,412	–	858	527	–
Enterprise	82F/14W	Slocan	Slocan City	57	W.C. Wingert and L.M. Fried, New Denver	834	Crude ore	4	21,220	–	95,217	245,422	301
Simonac (Minnehaha)	82F/14W	Slocan	Sandon	57	Kam Kotia – Burkam Joint Venture	27,429	Lead concentrates, 2,467 tons; zinc concentrates, 2,708 tons	–	415,373	–	2,996,445	3,346,671	23,882
Victor	82F/14W	Slocan	Sandon	59	E. Peterson, Sandon	14	Crude ore	1	1,300	–	10,683	776	–
Crown	82F/15W	Slocan	Ainsworth	60	Dave Norcross, Nelson	52	Crude ore	–	2,133	–	4,719	8,493	–
Kootenay Florence (Western Mill)	82F/15W	Slocan	Ainsworth	61	R.B. Savage, Nelson	19	Salvage	–	97	–	2,880	3,775	–
General, Grant	82F/15W	Slocan	Woodbury Creek	62	G and S Enterprises, Ainsworth	5	Crude ore	–	244	–	236	321	–
Bull River mine	82G/11W	Fort Steele	Wardner	66	Placid Oil Company	206,331	Copper concentrates, 8,762 tons	1,037	51,909	4,357,281	–	–	–
Lavina	82K/7W	Slocan	Hamill Creek	72	A. Graham, Kaslo	13	Crude ore	–	220	–	4,617	5,148	–

*Ceased production in 1971. Shipments made from stockpile.

TABLE I – METAL PRODUCTION, 1972 *(Continued)*

Mount Copeland mine	82M/1W	Revelstoke	Revelstoke	84	King Resources Co.	52,211	Molybdenite concentrates, 600 tons containing 698,268 lb. of molybdenum	–	–	–	–	–	–
Mosquito King, Ex	82M/4E	Kamloops	Adams Plateau	85	Giant Metallics Mines Ltd.	234	Lead concentrates, 64 tons; zinc concentrates, 15 tons	–	5,592	–	74	25	76
Energite	82M/5W	Kamloops	North Barriere River		R.A. Rabbitt, Kamloops	5	Crude ore	–	111	–	2,956	1,436	–
Pride of Emory mine	92H/6W	New Westminster	Hope	117	Giant Mascot Mines Ltd.	389,834	Nickel-copper concentrates, 18,994 tons containing 3,682,367 lb. of nickel and 156,739 lb. of cobalt	–	–	2,610,512	–	–	–
Similkameen mine (Ingerbelle)	92H/7E	Similkameen	Princeton	120	Similkameen Mining Co. Ltd.	3,053,000	Copper concentrates, 40,568 tons	14,482	65,566	20,557,305	–	–	–
Brenda mine	92H/16E	Osoyoos	Brenda Lake	142	Brenda Mines Ltd.	9,503,192	Copper concentrates, 78,882 tons; molybdenite concentrates, 11,385 tons containing 13,398,770 lb. of molybdenum	4,270	286,509	33,631,551	–	–	–
Craigmont mine	92I/2W	Nicola	Merritt	146	Craigmont Mines Ltd.	1,873,543	Copper concentrates, 83,012 tons; iron concentrates, 39,066 tons	–	–	46,894,145	–	–	–
Lornex mine	92I/6E	Kamloops	Highland Valley	150	Lornex Mining Corp. Ltd.	2,851,824	Copper concentrates, 55,805 tons	218	138,524	35,378,177	–	–	–
OK (Alwin)	92I/6E	Kamloops	Quiltanton Lake	156	O.K. Syndicate	83,613	Copper concentrates, 3,788 tons	183	19,887	2,539,426	–	–	–
Bethlehem mine	92I/7W	Kamloops	Highland Valley	170	Bethlehem Copper Corp. Ltd.	5,964,696	Copper concentrates, 75,359 tons	1,375	151,671	48,568,603	–	–	–
Sunro mine	92C/8E	Victoria	River Jordan	240	Jordan River Mines Ltd.	126,000	Copper concentrates, 1,849 tons	92	2,219	850,540	–	–	–
Texada mine	92F/10E	Nanaimo	Texada Island	269	Texada Mines Ltd.	1,071,812	Iron concentrates, 532,202 tons; copper concentrates, 7,395 tons	1,274	46,209	3,473,798	–	–	–
Myra mine	92F/12E	Alberni	Buttle Lake	270	Western Mines Ltd.	5,383	Included with Lynx mine	–	–	–	–	–	–
Lynx mine	92F/12E	Alberni	Buttle Lake	271	Western Mines Ltd.	374,022	Copper concentrates, 27,954 tons; lead concentrates, 3,510 tons; zinc concentrates, 29,799 tons	12,175	526,216	14,818,127	4,902,959	38,007,782	148,990
Britannia mine	92G/11E	Vancouver	Howe Sound	275	Anaconda Britannia Mines, Division of Anaconda Canada Ltd.	785,517	Copper concentrates, 33,828 tons; gold concentrates, 1 ton	50	97,259	10,689,993	–	–	–
Old Sport mine	92L/6E	Nanaimo	Benson Lake	289	Coast Copper Co. Ltd.	225,761	Copper concentrates, 17,337 tons	5,406	43,280	8,499,290	–	–	–

TABLE I – METAL PRODUCTION, 1972 *(Continued)*

Island Copper mine	92L/11W, 12E	Nanaimo	Port Hardy	[illegible]	Utah Mines Ltd	7,980,429	Copper concentrates, 142,115 tons, molybdenite concentrates, 408 tons containing 345,334 lb. of molybdenum	37,778	185,314	[illegible]	–	–	–
Boss Mountain mine	93A/2W	Cariboo	Big Timothy Mountain	329	Noranda Mines, Ltd (Boss Mountain Div.)	Ceased production in 1971, shipped from stock pile	Molybdenite concentrates, 598 tons containing 665,350 lb. of molybdenum	–	–	–	–	–	–
Gibraltar mine	93B/9W	Cariboo	McLeese Lake	338	Gibraltar Mines Ltd	10,861,500	Copper concentrates, 122,774 tons	–	–	74,412,300	–	–	–
Endako mine	93K/3E	Omineca	Endako	351	Canex Placer Ltd (Endako Mines Div.)	6,382,000	Molybdenite concentrates, 2,755 tons, molybdenum tri-oxide, 6,744 tons, ferro-molybdenum, 358 tons, total content, 10,980,284 lb. of molybdenum	–	–	–	–	–	–
Pinchi Lake mine	93K/9W	Omineca	Pinchi Lake	364	Cominco Ltd	†	Mercury	–	–	–	–	–	–
Silver Queen	93L/2E	Omineca	Houston	370	Bradina Joint Venture	111,907	Copper concentrates, 789 tons, bulk zinc lead concentrates, 2,616 tons	1,244	137,224	349,118	385,967	2,515,229	14,649
Cronin mine	93L/15W	Omineca	Smithers	420	Kindrat Mines Ltd	700	Lead concentrates, 78 tons, zinc concentrates, 82 tons	10	8,865	–	99,089	105,034	1,228
Granisle mine	93L/16E	Omineca	Babine Lake	425	Granisle Copper Ltd	2,537,138	Copper concentrates, 36,648 tons	12,234	121,810	24,909,713	–	–	–
Bell mine (Newman)	93M/1E	Omineca	Babine Lake	426	Noranda Mines, Ltd (Bell Copper Div.)	767,270	Copper concentrates, 11,823 tons	3,630	–	6,397,979	–	–	–
Tasu mine	103C/16E	Skeena	Tasu Harbour	494	Wesfrob Mines Ltd	1,232,384	Iron concentrates, 640,632 tons, copper concentrates, 13,063 tons	1,777	79,496	5,176,140	–	–	–
British Columbia Molybdenum mine	103P/6W	Skeena	Alice Arm	504	British Columbia Molybdenum Ltd	521,626	Molybdenite concentrates, 1,402 tons containing 1,680,025 lb. of molybdenum	–	–	–	–	–	–
Granduc mine	104B/1W	Skeena	Stewart	514	Granduc Operating Company	2,089,865	Copper concentrates, 86,667 tons	7,389	436,296	47,846,156	–	–	–

† Details confidential

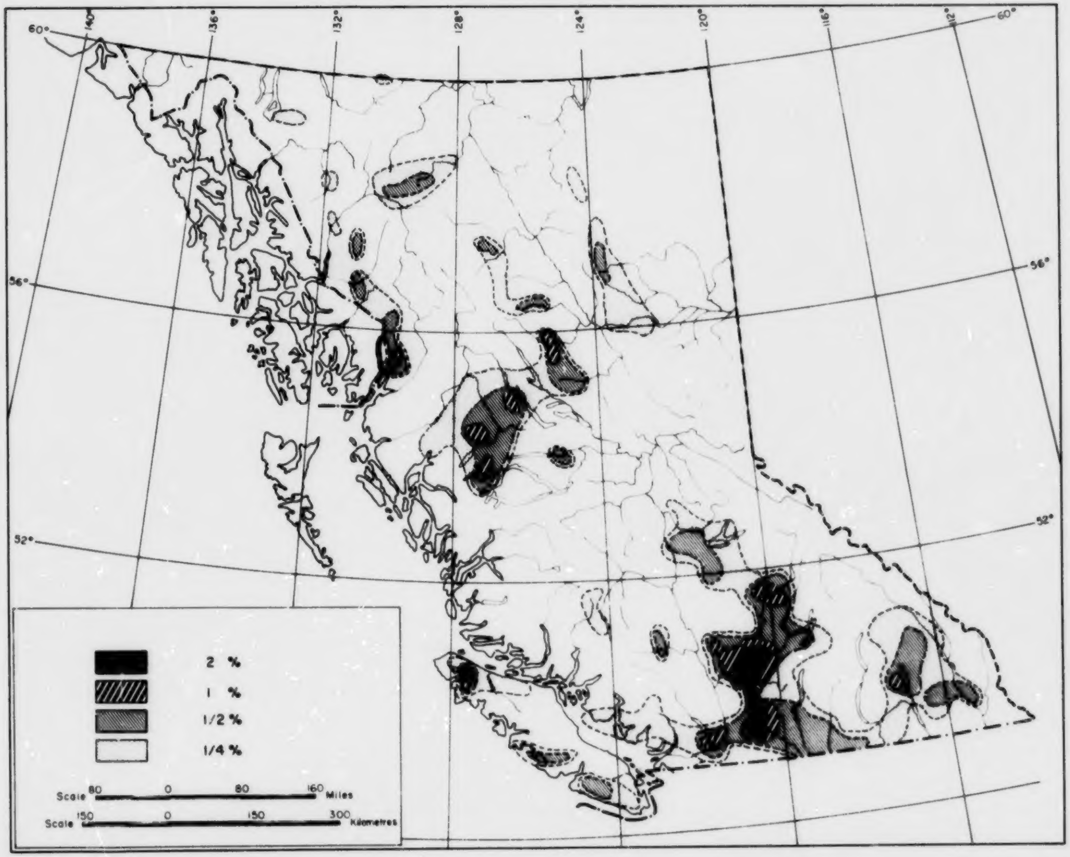
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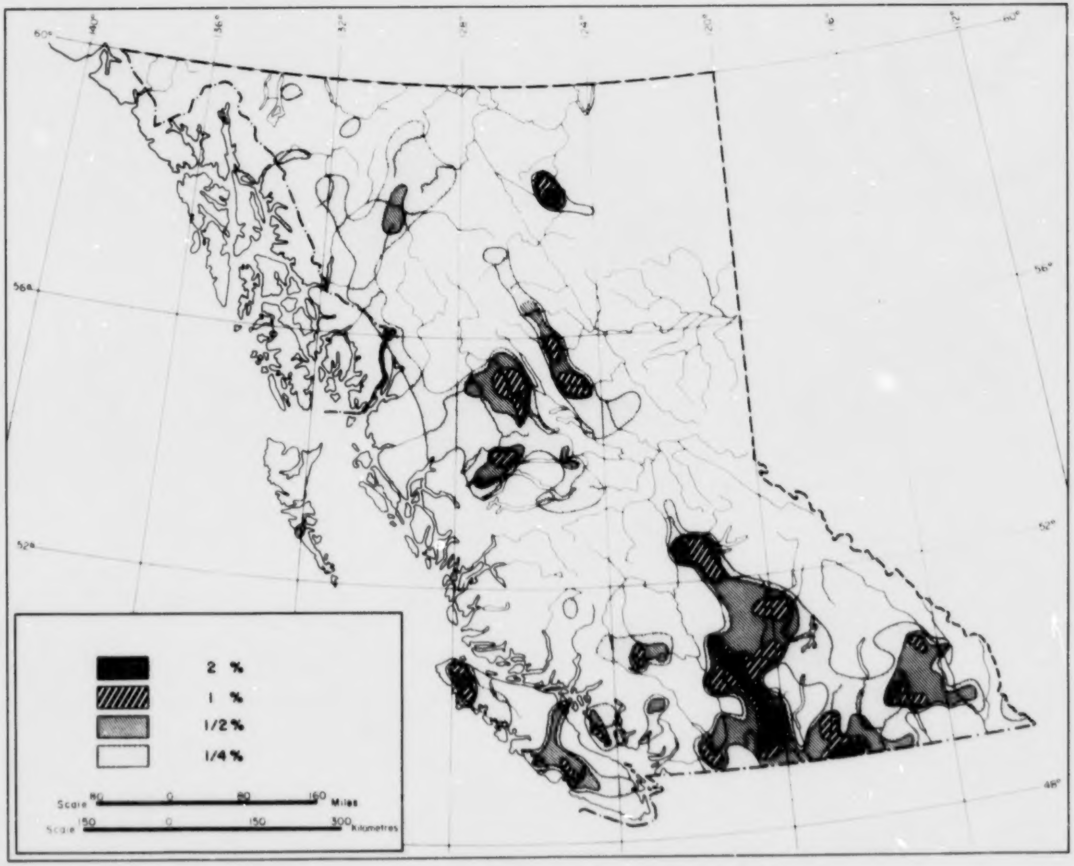
Figure 1. Distribution of mineral properties active in 1972.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Scale 80 0 80 160 Miles
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Figure 2. Distribution of mineral properties active in 1971.

REPORTS ON METAL MINES

INTRODUCTION

The reports that form the body of this Chapter comprise a large number of brief tabulated summaries of information concerning known active properties and mines and a smaller number of detailed geological reports of properties, mines, and areas of mineral potential. The sources of information, organization of the report, locations, policy on names, and other Departmental publications during 1972 are discussed below.

SOURCES OF INFORMATION: (1) Geologists on the staff of the Mineralogical Branch prepare reports on mineralized areas and mineral deposits for publication in Geology, Exploration, and Mining in British Columbia. These reports are concerned either with areas and properties under active exploration, recent mineral discoveries of importance, or are part of a more general study of mineralized areas which will form the body of a subsequent bulletin. The following substantial geological reports are included in this volume:

AFTON, by V. A. Preto.
BOOM, FRANKIE (KWANIKA), by J. A. Garnett.
BUCK CREEK AREA, by B. N. Church.
CODE, FEN, by B. N. Church.
DEER, by B. N. Church.
DIAMOND BELLE, by B. N. Church.
EAGLE, by A. Panteleyev.
GC, HAB, BUY, by A. Panteleyev.
GO, G, by A. Panteleyev.
GROUSE MOUNTAIN AREA, by B. N. Church.
HARRISON, LUCKY JIM, by R. I. Thompson.
HOT, CHIEF, by B. N. Church.
ISLAND COPPER MINE, by K. E. Northcote.
JA, by W. J. McMillan.
KWANIKA CREEK AREA, by J. A. Garnett.
LENNAC LAKE – REDTOP CREEK AREA, by N. C. Carter.
NITINAT TRIANGLE, by K. E. Northcote.
OK (ALWIN), by W. J. McMillan.
ROBB LAKE PROPERTY, by R. I. Thompson.
SHEBA, by W. J. McMillan.

(2) A considerable amount of information in the following reports was supplied by exploration companies. Their cooperation in completing and returning exploration questionnaires for each of the properties on which they worked is gratefully acknowledged by the Department and should be greatly appreciated by all users of this Report. In some instances this information is augmented by staff geologists or mine inspectors.

(3) Geological, geophysical, and geochemical reports accepted by the Department for credit as assessment work contain a large amount of valuable information. The results of work presented in assessment reports that were accepted by May 1, 1973 are summarized and published herein. The last report summarized is Assessment Report 4195. Assessment reports accepted after May 1, 1973, concerning properties for which exploration

questionnaires have already been submitted to the Department are entered as references on the property write-up until this manuscript is finalized for publication. Reports accepted in 1972 for work done in 1971 are not summarized if the work was previously reported on exploration questionnaires. Because of this policy not all assessment reports appear as references.

Assessment reports are available for study or for duplication at cost one year after the date of their submission.

ORGANIZATION: The reports are arranged sequentially according to National Topographic System map designation. In the NTS designation, the whole of Canada is divided into primary quadrangles, each 4 degrees latitude by 8 degrees longitude. Each is described by a number, the last digit of which indicates latitude and the first one or two indicates longitude (for example, 104). British Columbia is covered by six of these primary quadrangles except for minor areas. Figure 3 locates index maps (Figures A to G) used in this report. They coincide closely to the primary quadrangles: for example, Figure A includes quadrangle 82 and part of 83; Figure B, 92H and 92I; Figure C, 92 and part of 102; Figure D, 93; Figure E, 94; Figure F, 103; and Figure G, 104 and part of 114.

Each primary quadrangle is subdivided into 16 map-sheets, each 1 degrees latitude by 2 degrees longitude, and described by letters A to P (for example, 104G) proceeding from the southeast corner to the west in the southern panel, then east in the next panel, and so on. Each lettered quadrangle is subdivided into 16 map-sheets, each 15 minutes latitude by 30 minutes longitude and numbered 1 to 16 in an analogous manner to the lettering (for example, 104G/7). Finally each sheet is halved east and west for maps of the 1:50,000 series and are described, for example, 104G/7E.

An index to published maps may be obtained by requesting Indexes 8 to 14 from the Department of Lands, Forests, and Water Resources, Victoria.

The reports in this Chapter proceed by primary quandrangle from the southeastern part of the Province, Figure A, to the northwestern part, Figure G. Within each primary quandrangle the order proceeds from A/1E to A/1W to A/2E, and sequentially to P/16E. In some instances, exceptions are made so that adjacent prospects are not widely separated.

LOCATIONS: In this report the location of a property is described by latitude and longitude as well as by NTS designation of the 1:50,000 map-sheet in which it lies. The location of a large and commonly irregular group of claims is given as a range of coordinates which outlines the rectangle which will encompass the group, it is not necessarily the area in which the work was done. Ranges of coordinates are also used for properties that have several scattered mineral deposits and for properties that have mineral deposits, the location of which is uncertain. The location of the centre of a small group of claims, or of a single mineral deposit, is given as a single coordinate pair, the accuracy of which varies with the type of data from which the claims were plotted.

NAMES: The name or names given to a property mainly are those of one or more of the claims that constitute the group. Often a name is used by which the property originally or formerly had been known (for example, Glacier Gulch, Magnum) or which was used in the mineral inventory but the claim names were since changed (for example, Golconda now comprise the Copper King, Voight, Northstar, Trout, etc., claims). Occasionally a name is used which is derived from the name of the company owning the property (for example, Bralorne, Granisle). Where practicable, all names of claims comprising a property are given under the heading 'Claims.'

OWNERSHIP: Whenever possible the owner or owners of the claims reported on is stated. For recorded claims it may be possible to determine the owner at the time the manuscript was prepared if Departmental records were up to date and if there were no unrecorded bills of sale or option agreements outstanding. For Crown grants, unless an extensive search is made, it is sometimes impossible to be certain of their ownership.

In instances when the operator (the company or individual for whom the work was done or who paid for it) is known but the owner is uncertain, then only the operator is recorded; when the owner is also the operator then only the owner is recorded; and when the owner is not the operator and both are known then both are recorded.

PUBLICATIONS: Geology, Exploration, and Mining in British Columbia continues to be the main vehicle for publication of data on metal and mineral exploration. However, during 1972 several other means were used, both Departmental and external. In this year because of the Twenty-fourth International Geological Congress held in Canada a large number of articles were contributed to guidebooks published by the Congress for geological excursions within British Columbia.

The following two bulletins were published by the Department in 1972:

Bulletin 59:	Geology of Copper Mountain, by V. A. Preto.
Bulletin 62:	Gravity, Magnetics, and Geology of the Guichon Creek Batholith, by C. A. Ager, W. J. McMillan, and T. J. Ulrych.

These two bulletins are the product of continuing major projects of the Department, the Guichon Creek batholith project and the Nicola project. The first deals with a 50-square-mile area south of Princeton, near the southern end of the copper-bearing Nicola graben. Relationships between Triassic volcanic rocks of the Nicola Group, coeval Copper Mountain intrusions, and mineralization are revealed. The geology of the Ingerbelle and Copper Mountain orebodies are described as well as many prospects. The second bulletin presents the results of a detailed gravity survey of the Guichon Creek batholith. It also summarizes the geology and presents filtered aeromagnetic maps which, with the filtered gravity maps, are used to outline an initial model of the batholith, having implications regarding the ore deposits of the Highland Valley.

The following preliminary geological maps were released in 1972:

Map No. 8:	Geological Compilation Map of Stewart, Anyox, Alice Arm, and Terrace Areas, 103P and I, by N. C. Carter and E. W. Grove.
Map No. 9:	Preliminary Geological Map of part of Hogem Batholith-Duckling Creek Area (mainly 93N/13 and 14), by J. A. Garnett.

The following aeromagnetic maps of the Federal-Provincial Government-financed programme were released in 1972:

82F – 1, 5 to 16 inclusive
82G – 3, 4, 5, 6, 11, 12, 13, 14
93N – 10, 11, 14, 15, 16
94D – 1, 2, 7, 8, 9, 10, 15, 16
103P – 5, 6, 7, 8

Finally the following extensive list of papers was published outside the Department:

Church, B. N. and Wilson, H.D.B., Volcanology of the Wanipigow Lake-Beresford Lake Area, *Man. Mines Branch,* 17-1, Report 5.

Holland, Stuart S., McCammon, J. W., Ingram, W., and James, A.R.C., British Columbia Mineral Industry, 1971, *Western Miner,* Vol. 45, No. 4, pp. 70-76.

Jackson, E. V., Carter, N. C., and Fyles, J. T., Mineral Inventory and Current Mining Activity in British Columbia, *Can. Min. Jour.,* Vol. 93, No. 4, pp. 50-57.

Ney, C. S, Anderson, J. M., and Panteleyev, A., Discovery, Geological Setting, and Style of Mineralization, Sam Goosly Deposit, *C.I.M.,* Bull., Vol. 65, No. 723, pp. 53-64.

Contributions to guidebooks prepared for the Twenty-fourth International Geological Congress excursions were as follows:

EXCURSION A03 – C03:

Guidebook to Geology of the Southern Canadian Cordillera

Church, B. N., Early Tertiary Succession and Basement Rocks of the Okanagan Valley, pp. 49-53.

Fyles, J. T., Selkirk and Monashee Mountains, pp. 31-41.

Monger, J.W.H. and Preto, V. A., Geology of the Southern Canadian Cordillera, pp. 1-12.

.........., Monashee Mountains and Interior Plateau, pp. 41-49.

Preto, V. A., Interior Plateau to Cascade Mountains, pp. 53-59.

EXCURSION A09 – C09:

Guidebook to Copper and Molybdenum Deposits of the Western Cordillera

Carter, N. C., Geology of Granisle Mine, pp. 27-36.

McMillan, W. J., Geology of Highland Valley Porphyry Copper District, pp. 53-69.

Ney, C. S. and Sutherland Brown, A., Copper and Molybdenum Deposits of the Western Cordillera, pp. 1-7.

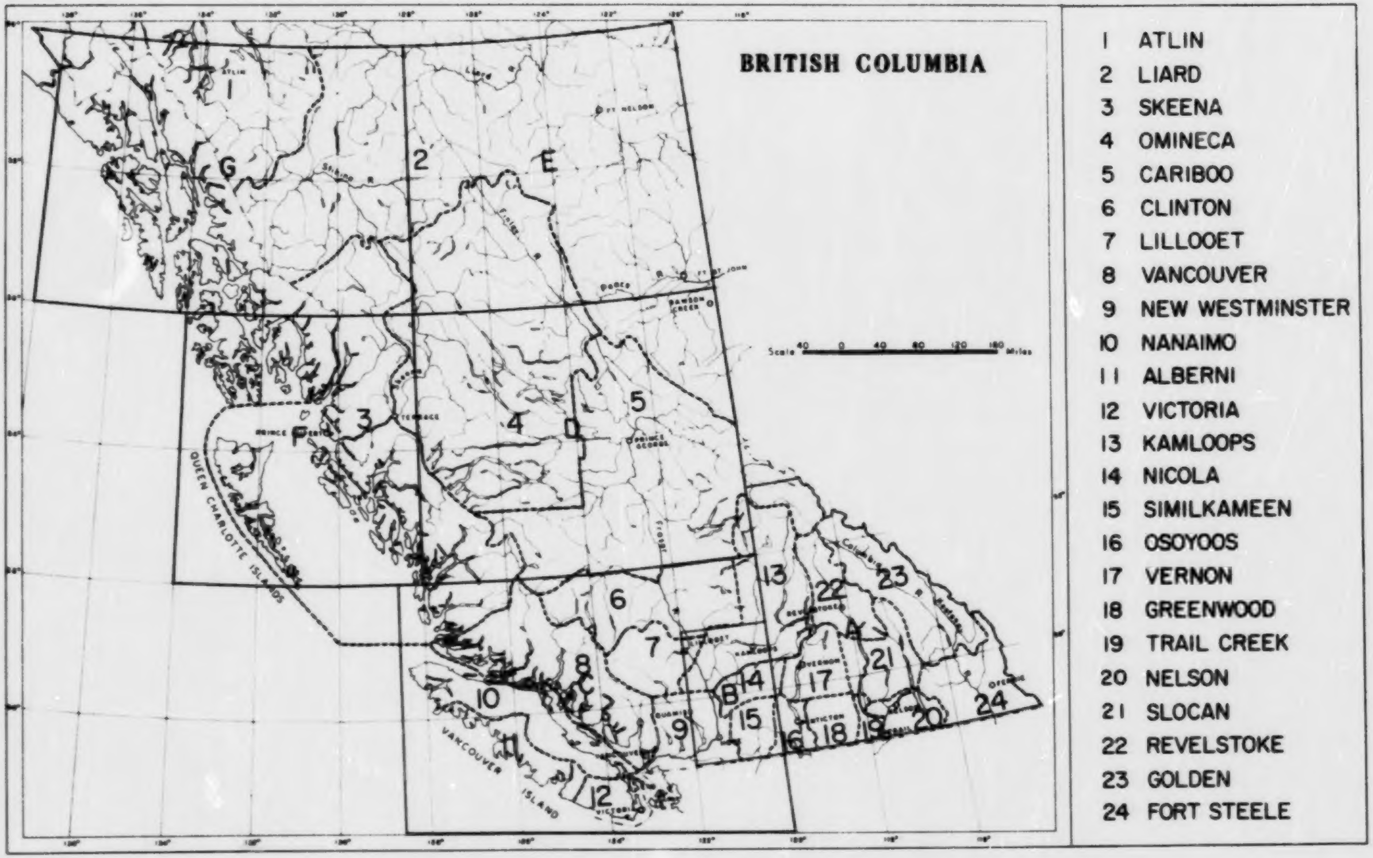
Northcote, K. E., Geology of Island Copper Mine, pp. 20-24.

Preto, V. A., Geology of Copper Mountain and Ingerbelle Mines, pp. 69-76.

Sutherland Brown, A., Geology of Britannia Mine, pp. 7-14.

.........., Geology of Texada Mine, pp. 15-20.

.........., Geology of Red Bird Prospect, pp. 24-26.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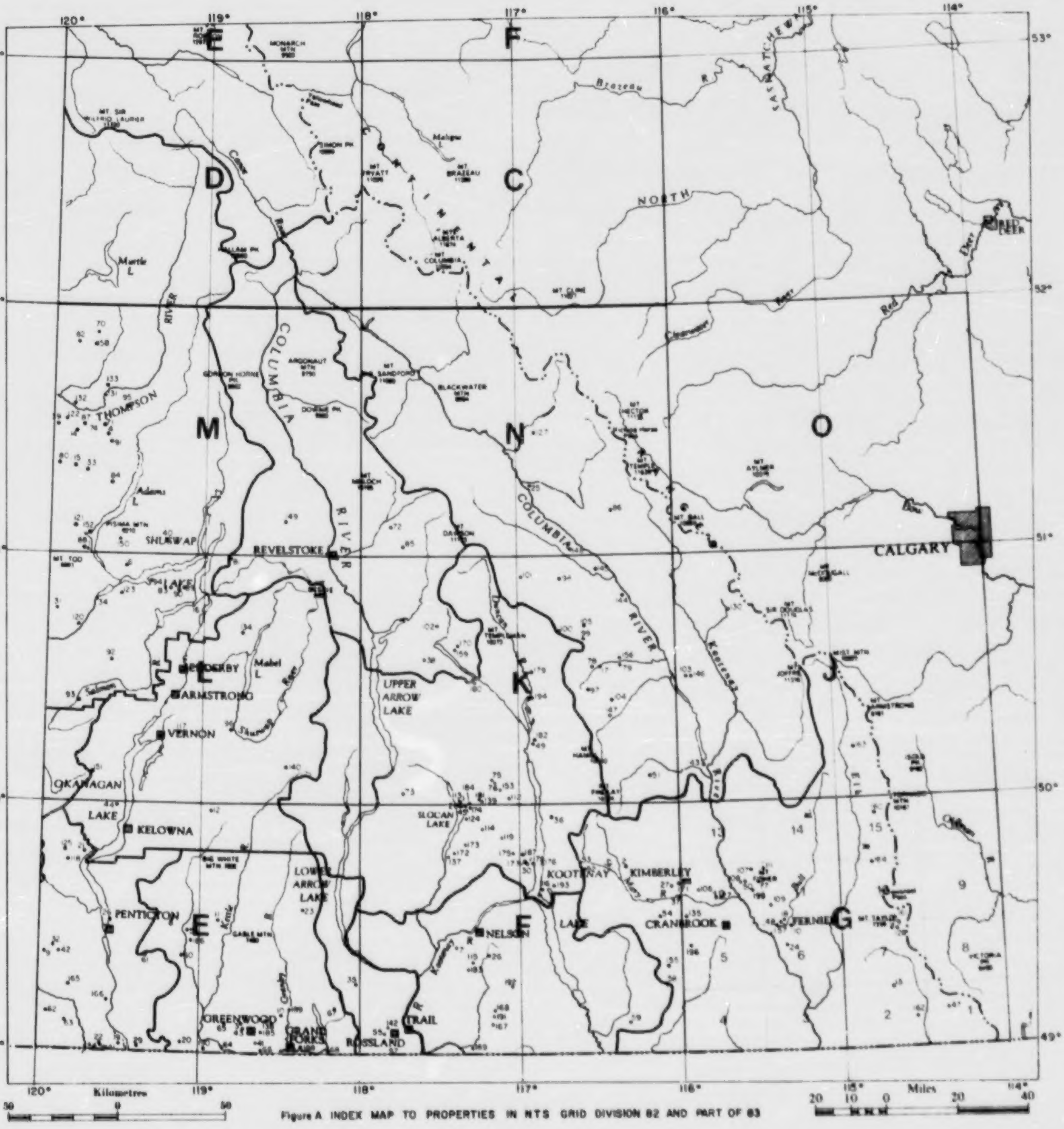
Stikine R.
Fraser R.
Peace R.
FT. ST. JOHN
DAWSON CREEK
PRINCE RUPERT
TERRACE
PRINCE GEORGE
Fraser
Columbia R.
Kootenay
QUEEN CHARLOTTE ISLANDS
VANCOUVER ISLAND
VICTORIA
A
B
C
D
E
F
G
1 ATLIN
2 LIARD
3 SKEENA
4 OMINECA
5 CARIBOO
6 CLINTON
7 LILLOOET
8 VANCOUVER
9 NEW WESTMINSTER
10 NANAIMO
11 ALBERNI
12 VICTORIA
13 KAMLOOPS
14 NICOLA
15 SIMILKAMEEN
16 OSOYOOS
17 VERNON
18 GREENWOOD
19 TRAIL CREEK
20 NELSON
21 SLOCAN
22 REVELSTOKE
23 GOLDEN
24 FORT STEELE

Figure 3. Index map of mining divisions with outlines (in red) of Figures A to G.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MT SIR WILFRID LAURIER
SIMON PK
MT FRYATT
MT BRAZEAU
MT ALBERTA
MT COLUMBIA
MT CLINE
Maligne L
Brazeau
SASKATCHEWAN
NORTH
CONTINENTAL
RED DEER
Red Deer
Clearwater
Myrtle L
RIVER
COLUMBIA
ARGONAUT MTN
MT SANDFORD
BLACKWATER MTN
THOMPSON
Adams L
SHUSWAP
LAKE
REVELSTOKE
MT DAWSON
COLUMBIA
RIVER
CALGARY
MT AYLMER
MT BALL
SIR DOUGLAS
MIST MTN
MT JOFFRE
MT ARMSTRONG
MT TOD
ENDERBY
ARMSTRONG
Mabel L
VERNON
Shuswap
Salmon
UPPER ARROW LAKE
Kootenay
Elk
OKANAGAN LAKE
KELOWNA
SLOCAN LAKE
KOOTENAY LAKE
KIMBERLEY
CRANBROOK
FERNIE
Bull
BIG WHITE MTN
LOWER ARROW LAKE
PENTICTON
Kettle
GABLE MTN
NELSON
Kootenay
GREENWOOD
GRAND FORKS
TRAIL
ROSSLAND
MT TABOR
VICTORIA
Oldman
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2
4
5
6
7
8
9
13
14
15
Kilometres
50
0
50
Miles
20
10
0
20
40

Figure A INDEX MAP TO PROPERTIES IN NTS GRID DIVISION 82 AND PART OF 83

KEY TO PROPERTIES ON INDEX MAP, FIGURE A.

1. PAT, page 86.
2. WD, page 55.
3. LOST, page 37.
4. HILLTOP, BOB, page 90.
6. EAST, page 81.
7. REFERENDUM, page 52.
8. IVY, CAPCO, MAY, page 44.
9. PATRICIA, page 40.
10. IKE, page 34.
11. FUKI, page 43.
12. PB, page 46.
13. ROK, CAT, page 63.
14. PY, page 89.
15. GOODLUCK, HARPER, ULTIMA, page page 88.
16. DAWN, LAKEVIEW, page 83.
17. ANNETTE, SLIDE, page 74.
18. COPPER KING, page 64.
19. DESERT, page 39.
20. OLD NICK, page 38.
21. ROHANNA, page 45.
22. WALT, BUL, page 39.
23. KINGFISHER, page 44.
24. TIE, page 63.
25. HCJ, CAM, page 616.
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PENTICTON 82E

BURNT BASIN (No. 67, Fig. A) By P. E. Olson

LOCATION: Lat. 49° 10.5' Long. 118° 07' (82E/1E)
GREENWOOD M.D. At approximately 4,000 feet elevation near the heads of Josh and Mollie Creeks, 8 miles north-northeast of Christina Lake village.

CLAIMS: Mineral Leases M-52, M-118, M-119, M-131, M-183, M-196, M-197, M-205, and M-365 which comprise 15 Crown-granted claims including BURNT BASIN (Lot 1136), AJAX (Lot 1509), EVA BELL (Lot 2031), and HALIFAX (Lot 3042); also the located claims SHIRLEY 1 to 8, CHRISTINA 1 to 6, BP 1 to 3 Fractions, HAVANA Fraction, and GALENA Fraction.

ACCESS: By a mining road which leaves the Christina Lake-Kinnaird Highway immediately west of the Paulson bridge.

OWNER: Burnt Basin Mines Ltd.

OPERATORS: BURNT BASIN MINES LTD., Box 1496, Grand Forks and DONNA MINES LTD., 642 Clark Drive, Vancouver 6.

METALS: Silver, lead, zinc (production shown on Table I).

DESCRIPTION: This region is underlain by limestones and argillaceous limestones of Pennsylvanian and/or Permian age. Beds generally strike northwest and have been invaded by numerous dykes and sills of diorite and syenite. Sparse mineralization consists of sphalerite with minor galena and magnetite. Where the formation has been exposed by stripping, northwesterly plunging folds have been noted. Where mineralization has been seen, it is noted that the sedimentary rocks are highly altered. Nowhere on the showings has any intensive mineralization been noted.

WORK DONE: Surface geological mapping, 1 inch equals 50 feet and magnetometer survey, 10 line-miles covering Eva Bell and Halifax; road construction, 1 mile on BP Fraction and Eva Bell; trenching and stripping on Eva Bell; surface diamond drilling, five holes totalling 661 feet on Eva Bell. A small shipment of ore was made to the Trail smelter. This shipment is reported to have graded around 16 per cent zinc, 8 per cent lead, and 6 ounces per ton silver. Mining was done from the surface along a mineralized shear about 10 feet wide and striking northerly. Diamond drilling indicates that the structure is discontinuous.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1968, p. 238; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 311.

ANN, CALEDONIA (No. 68, Fig. A)

LOCATION: Lat. 49° 00.5' Long. 118° 11' (82E/1E)
GREENWOOD M.D. At approximately 3,200 feet elevation on Castle Mountain, about 2 miles southeast of Cascade.

(82E/1E)

CLAIMS: ANN 1 to 158, CALEDONIA (Lot 1756), HUP 1 to 8, HAZ-AL 1 to 16, TUFF 1 to 4, H 1 to 16.
ACCESS: By road from Cascade, 3 miles.
OWNER: HUNTER POINT EXPLORATIONS LTD., 1955 Creelman Avenue, Vancouver 9.
METAL: Nickel.
DESCRIPTION: The prospect is centred on nickeliferous ultramafic rocks.
WORK DONE: Surface diamond drilling, three holes totalling 700 feet on Ann 4.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 373 (Mastodon).

MASTADON (No. 68, Fig. A)

LOCATION: Lat. 49° 00.5' Long. 118° 10.3' (82E/1E)
GREENWOOD M.D. At approximately 3,200 feet elevation about 4 miles southeast of Cascade.
CLAIMS: MASTADON (Lot 2384), CANYON C (Lot 2385), SYLVESTER K (Lot 2386), LITTLE BURNE Fraction (Lot 2387), MASTADON Fraction (Lot 2388), LITTLE BROWN (Lot 2390).
ACCESS: By road from Cascade, 4 miles.
OWNER: CHROMEX NICKEL MINES LTD., 1955 Creelman Avenue, Vancouver 9.
METAL: Nickel.
DESCRIPTION: The prospect is centred on nickeliferous ultramafic rocks.
WORK DONE: Surface diamond drilling, two holes totalling 600 feet on Mastadon Fraction.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 373 (Mastodon).

IKE (No. 10, Fig. A)

LOCATION: Lat. 49° 08.7' Long. 118° 29' (82E/1W)
GREENWOOD M.D. On west side of north fork of Granby River, 8 miles north of Grand Forks.
CLAIMS: IKE 1 to 25.
ACCESS: By road from Grand Forks, 8 miles.
OWNER: Ryslo Silver Mines Ltd.
OPERATOR: THE GRANBY MINING COMPANY LIMITED, Box 490, Grand Forks.
METALS: Copper, silver, gold.
DESCRIPTION: Chalcopyrite occurs in skarn.
WORK DONE: Magnetometer and electromagnetic survey covering 11.3 line-miles on the Ike 7, 8, and 22 to 25.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 374; Assessment Report 3780.

VOLCANO, FANTANTINE (No. 189, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 10.2' Long. 118° 26.4' (82E/1W)
GREENWOOD M.D. On the east side of Granby River, 9.5 miles north of Grand Forks.

(82E/2E)

CLAIMS: VOLCANO (Lot 1476) and FANTANTINE (Lot 1477) Crown grants and the EILEEN recorded mineral claim.

ACCESS: Via the Granby River road, 10 miles from Grand Forks.

OWNER: John Stoochnow.

OPERATOR: CARMAC SOIL CONDITIONERS LTD., 206, 810 Fifth Street, New Westminster.

METALS: Copper, gold, silver (present interest is the red soil and rock in the area).

DESCRIPTION: In the vicinity of the property there is a pronounced, rocky knob, mainly reddish in colour, which can be readily seen from the Granby River road. The reddish colour is due to an oxidized pyrite-pyrrhotite-chalcopyrite skarn at the contact between limestone and porphyry dykes.

WORK DONE: Some clearing was done immediately above the road in preparation for excavating of soil and talus material.

REFERENCE: *Minister of Mines, B.C.,* Ann. Rept., 1928, pp. 237, 238.

LEXINGTON (No. 66, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 00.5' Long. 118° 36.5' (82E/2E)
GREENWOOD M.D. At approximately 4,200 feet elevation 6 miles southeast of Greenwood.

CLAIMS: One hundred and one full-sized and 18 fractional claims including LEX, DEW, COD, and MAT, 7 mineral leases, 13 Crown-granted claims including LEXINGTON, CITY OF DENVER, and NO. 4 plus 3 mineral leases and 1 mineral claim (optioned).

ACCESS: By road from Greenwood, 9 miles.

OWNER: Lexington Mines Ltd.

OPERATOR: THE GRANBY MINING COMPANY LIMITED, Box 490, Grand Forks.

METALS: Copper, gold, silver.

DESCRIPTION: Mineralization comprises chalcopyrite erratically distributed in quartz porphyry and serpentine and in a vein system.

WORK DONE: Line-cutting covering Dew 1 to 24 and Cod 1 to 6 Fractions was carried out during 1971 by Lexington Mines Ltd. In 1972 The Granby Mining Company Limited percussion drilled 34 holes totalling 6,620 feet on the Lexington, City of Denver, No. 4, Dew 1, and Dew 7 claims. The drilling failed to intersect sufficient copper mineralization to justify continuation of the programme.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 376; Assessment Report 3693.

TONEY, VEN (No. 43, Fig. A)

LOCATION: Lat. 49° 05.3' Long. 118° 42.5' (82E/2E)
GREENWOOD M.D. Between Buckhorn and Haas Creeks, approximately 1.5 miles west of Greenwood.

(82E/2E)

CLAIMS: TONEY (Lot 1907), VEN, GOTCHA, VENDELA, VEND, ANTON, SERF, VICKI, ARN.

ACCESS: By logging road from Greenwood.

OWNER: Fury Explorations Ltd.

OPERATOR: PHELPS DODGE CORPORATION OF CANADA, LIMITED, 404, 1112 West Pender Street, Vancouver 1.

WORK DONE: Line-cutting covering Gotcha 12-15; geological mapping, 1 inch equals 660 feet covering all claims.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1967, pp. 225, 226; Assessment Reports 1067, 1878, 3932, 4125.

PHOENIX MINE (No. 185, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 05.8′ Long. 118° 35.9′ (82E/2E)
GREENWOOD M.D. The mine is at the head of Twin Creeks, about 3 miles east of Greenwood.

CLAIMS: There are about 230 recorded and Crown-granted claims held by the company. The main open-pit mine is on the OLD IRONSIDES Crown grant (Lot 589).

ACCESS: By good gravel roads from Greenwood and the Grand Forks-Greenwood Highway.

OWNER: THE GRANBY MINING COMPANY LIMITED, Phoenix Copper Division, Box 490, Grand Forks.

METALS: Copper, gold, silver (production shown on Table I).

WORK DONE:

The present mining operation embracing the old underground workings of the Phoenix mine was approaching the bottom of known ore zones. A decision to expand the modern pit, to uncover some marginal ore in the south section of the old mine, started a mining sequence which will extend the life of the mine by several years.

Mining was limited to the Old Ironsides open pit. The south rim of the pit was cleared and a three-year waste removal programme was started which will uncover ore during 1975. Mining in the old pit is nearly finished but the company has stockpiled nearly 4,000,000 tons of marginal ore which will provide mill-feed for the next few years. The mill handles about 1,000,000 tons of ore per year. A new ball mill was installed late in 1972.

Conventional open-pit mining methods are employed. Nine-inch blast holes are drilled with rotary machines and blasting is done with ammonium nitrate-fuel oil explosives mixed at the loading site. Excavating is done mainly with a 5-yard electric shovel, and hauling is done with various types of trucks which carry around 40 tons per trip.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 375.

STAN (No. 138, Fig. A)

LOCATION: Lat. 49° 07′ Long. 118° 34′ (82E/2E)
GREENWOOD M.D. East of Glenside Creek, 5 miles northeast of Greenwood on the south side of Highway 3.

(82E/2E)

CLAIMS: STAN, KR, ROCKLAND (Lot 1493), totalling approximately 48.
ACCESS: By road from Greenwood, 5 miles.
OWNER: King Resources Company.
OPERATOR: JASON EXPLORERS LTD., 775, 555 Burrard Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Copper-zinc mineralization is found in the vicinity of a medium-grained Nelson-type granodiorite intrusion cutting Anarchist Group metavolcanic and metasedimentary rocks.
WORK DONE: Surface diamond drilling, four holes totalling 1,160 feet on Stan 3 Fraction.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 375.

LOST (No. 3, Fig. A)

LOCATION: Lat. 49° 07' Long. 118° 43.5' (82E/2E)
GREENWOOD M.D. On Deadwood Ridge, 2 miles west of Greenwood.
CLAIMS: LOST, SOP, RIDGE, SAM, totalling 16 plus Crown-granted claims LIZZIE (Lot 2566), ST. EUGENE Fraction (Lot 2321), ST. LAWRENCE (Lot 1255), GOLD BUG (Lot 895), DEARHORN (Lot 1714), BEE (Lot 886).
ACCESS: By road from Greenwood, 2 miles.
OPERATOR: SPOKANE NATIONAL MINES, INC., 424 Hutton Building, Spokane, Washington 99204.
WORK DONE: A geological survey and line-cutting were done during 1971.
REFERENCE: Assessment Report 3482.

TEXAS (No. 64, Fig. A)

LOCATION: Lat. 49° 01.5' Long. 118° 51' (82E/2W)
GREENWOOD M.D. Between 2,300 and 3,100 feet elevation on the lower portion of Ingram Creek, north of Highway 3, 4 miles northwest of Midway.
CLAIMS: TEXAS (Lot 662), GRANADA (Lot 869), WAY 1 to 20, WAY Fraction.
ACCESS: By road from Greenwood, 10 miles.
OWNER: BONUS RESOURCES LTD., 101, 325 Howe Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Rocks include units of the Permian Anarchist Group and Tertiary lavas and Coryell-type and Nelson-type intrusions.
WORK DONE: Surface geological mapping, 1 inch equals 400 feet; ground magnetometer survey; and induced polarization survey, 8 line-miles covering Way 1-20, Texas, and Granada; geochemical survey, 646 samples covering Way 1-20.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, pp. 303, 304 (G-To); Assessment Reports 3920, 4124.

TYEE (No. 65, Fig. A)

LOCATION: Lat. 49° 07.5′ Long. 118° 50′ (82E/2W)
GREENWOOD M.D. Between 4,400 and 5,200 feet elevation on the southwest slope of Copper Mountain, about 8 miles west-northwest of Greenwood.

CLAIMS: TYEE, TROUT, LEO, JENNIE, CORONATION, INGRAM CREEK Fraction, MABEL, totalling 27.

ACCESS: By logging road from Greenwood, 11 miles.

OWNER: WESTBRIDGE MINING COMPANY LTD., 45, 553 Granville Street, Vancouver 1.

METALS: Gold, silver, copper.

DESCRIPTION: Three rock types are recognized in the area – sheared and deformed Anarchist Group quartzite, sheared granodiorite, and Tertiary volcanic rocks at higher elevations. An easterly trending vein system found in the granodiorite carries gold, silver, and copper values. Pyrrhotite and copper mineralization are found in a shear zone.

WORK DONE: Trenching, approximately 37,500 square feet on Mabel, Jennie, and Jennie 3 Fraction.

OLD NICK (No. 20, Fig. A)

LOCATION: Lat. 49° 02.7′ Long. 119° 06.2′ (82E/3E)
GREENWOOD M.D. At elevations of 3,000 to 3,600 feet immediately east of Bridesville and south of Highway 3, 23 miles east of Osoyoos.

CLAIMS: OLD NICK, UR, totalling 57.

ACCESS: By Highway 3 and secondary road from Osoyoos.

OWNER: NORTHERN DEEP LEVEL MINES LTD., 1300, 355 Burrard Street, Vancouver 1.

METAL: Nickel.

DESCRIPTION: The claims are underlain by greenstones, quartzites, greywacke, and limestone of the Anarchist Group.

WORK DONE: Magnetometer and geochemical surveys.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1968, p. 225; Assessment Report 3677.

SUE (No. 29, Fig. A)

LOCATION: Lat. 49° 01.5′ Long. 119° 22.5′ (82E/3W)
OSOYOOS M.D. On the southwest slope of Anarchist Mountain, straddling Highway 3, 3 miles east of Osoyoos.

CLAIMS: SUE 13, 15, 17, 19, 27 to 42.

ACCESS: By highway 3 from Osoyoos.

OPERATOR: WHITE RIVER MINES LTD., 1155, 555 Burrard Street, Vancouver 1.

WORK DONE: Geochemical survey, 489 soil samples.

REFERENCE: Assessment Report 3718.

DESERT (No. 19, Fig. A)

LOCATION: Lat. 49° 01.8' Long. 119° 29.5' (82E/3W, 4E)
OSOYOOS M.D. At elevations of 1,600 to 2,900 feet on the east flank of Mount Kruger, 1 mile west of Osoyoos.

CLAIMS: DESERT 1 to 24.

ACCESS: By road from Osoyoos.

OWNER: MAXWELL MINES LTD., 534, 789 West Pender Street, Vancouver 1.

WORK DONE: Magnetometer survey covering 13.8 line-miles.

REFERENCE: Assessment Report 3669.

RIV (No. 141, Fig. A)

LOCATION: Lat. 49° 00'-01.5' Long. 119° 32.4'-35' (82E/4E)
OSOYOOS M.D. On Lone Pine Creek, south of Kilpoola Lake, 3 miles west of Osoyoos.

CLAIMS: RIV 1 to 31, 40, 41, WHITE KNIGHT (Lot 1081).

ACCESS: By road from Osoyoos, 5 miles.

OWNER: RIVIERA INDUSTRIES & RESOURCES LTD., 200, 505 Burrard Street, Vancouver 1.

DESCRIPTION: The focus of prospecting interest is a contact between quartz monzonite and volcanic rocks.

WORK DONE: Surface geological mapping, 1 inch equals 500 feet covering Riv 1-4; surface diamond drilling, two holes totalling 457 feet on Riv 2.

WALT, BUL (No. 22, Fig. A)

LOCATION: Lat. 49° 01.5'-03.5' Long. 119° 34.8'-36.7' (82E/4E)
OSOYOOS M.D. At 3,500 feet elevation between Richter and Blue Lakes, 5 miles west of Osoyoos.

CLAIMS: WALT, BUL, totalling 66.

ACCESS: By road from Richter Pass, 7 miles.

OWNER: MULTIPLE MINING DEVELOPMENT LTD., 4316 – 53rd Street, Red Deer, Alta.

METALS: Copper, molybdenum.

WORK DONE: Line-cutting.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 384; Assessment Report 3701.

KING EDWARD (SUSAP, SUP) (No. 63, Fig. A)

LOCATION: Lat. 49° 06.8' Long. 119° 49.6' (82E/4W)
OSOYOOS M.D. At approximately 4,000 feet elevation on the south side of Indian Reserve 13 and bordering the north side of Susap Creek, 10 miles south of Keremeos.

CLAIMS: BUCK 11 to 26, RON 1 to 23, SUP 3 to 6, DON 1 to 3, SUSAP 2 Fraction.

(82E/4W)

ACCESS: By Highway 3 from Keremeos, 12 miles.

OWNER: Cro-Mur Mining and Exploration Co. Ltd.

OPERATOR: SCURRY-RAINBOW OIL LIMITED, 709 Eighth Avenue SW., Calgary, Alta.

METALS: Copper, molybdenum, silver.

DESCRIPTION: Syenites, diorites, and volcanic rocks are host to a silicified zone containing copper and molybdenum mineralization.

WORK DONE: Surface geological mapping, 1 inch equals 500 feet; induced polarization survey, 12 line-miles and magnetometer survey, 12 line-miles covering Buck 19 and Sup 3-6; surface diamond drilling, three holes totalling 1,567 feet on Buck 19 and Sup 4 and 5.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 384.

PA (No. 62, Fig. A)

LOCATION: Lat. 49° 09′ Long. 119° 55.5′ (82E/4W)
OSOYOOS M.D. At the head of Gillanders Creek, immediately west of Indian Reserve 13, 7 miles southwest from Keremeos.

CLAIMS: PA 1 to 18.

ACCESS: By helicopter from Keremeos, 7 miles.

OWNER: UNION CARBIDE EXPLORATION CORPORATION, 601, 1112 West Pender Street, Vancouver 1.

METAL: Tungsten.

DESCRIPTION: The prospect is centred on an occurrence of scheelite in skarn.

WORK DONE: Surface geological mapping, 1 inch equals 800 feet covering Pa 1 to 18 and 1 inch equals 50 feet covering Pa 1 to 6; geochemical survey, 17 dust, chip, and grab rock samples.

GOLCONDA (No. 165, Fig. A) By David Smith

LOCATION: Lat. 49° 15.7′ Long. 119° 50.5′ (82E/5W)
OSOYOOS M.D. Adjacent to Olalla, west and south of Olalla Creek.

CLAIMS: COPPER KING (Lot 3065s), VOIGHT, NORTHSTAR, TROUT, ALMA 1 to 7.

ACCESS: By gravel road from Olalla, 1.5 miles.

OWNER: ADAM MILLING LTD., Box 36, Olalla.

METALS: Copper, molybdenum.

WORK DONE: In 1972, 50 feet of drifting was done in the No. 1 adit. Rehabilitation of old underground workings was carried out. On surface, a powder magazine was built and extensive repairs and reconstruction of the mill were carried out.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 395; 1971, p. 385.

PATRICIA (No. 9, Fig. A)

LOCATION: Lat. 49° 23.5′ Long. 119° 57.0′ (82E/5W)
OSOYOOS M.D. At 6,100 to 6,500 feet elevation between Nickel Plate Lake and Apex Mountain, approximately 18 miles west of Penticton.

(82E/5W)

CLAIMS: PATRICIA 2 to 14, 16, 29, 30.

ACCESS: By the Apex Mountain road from Penticton, 25 miles.

OWNER: CORVAL RESOURCES LTD., 420, 475 Howe Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The claims are underlain by the Upper Triassic Nicola Group consisting of volcanic rocks intercalated with quartzite and limestone.

WORK DONE: Geochemical soil survey, 183 samples covering Patricia 1-14 during 1971; surface geological mapping 1 inch equals 200 feet and geochemical soil survey, 45 samples covering Patricia 3-12 during 1972.

REFERENCES: Assessment Reports 3561, 4233.

LOOKOUT, MOUNTAIN VIEW (No. 42, Fig. A)

LOCATION: Lat. 49° 23.7′ Long. 119° 52′ (82E/5W)
OSOYOOS M.D. Between 5,000 and 6,900 feet elevation at the head of Klohtelt Creek on Green Mountain, 15 miles southwest of Penticton.

CLAIMS: KAREN 1 to 16.

ACCESS: By the Nickel Plate and Klohtelt Creek roads from Penticton.

OWNER: LANTERN GAS & OIL LTD., 704, 525 Seymour Street, Vancouver 2.

METAL: Copper.

DESCRIPTION: Pyrrhotite and chalcopyrite occur at a contact between sedimentary rocks and a quartz monzonite intrusion.

WORK DONE: Magnetometer and geochemical surveys.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1931, p. 134; Assessment Report 3918.

JJ (No. 32, Fig. A)

LOCATION: Lat. 49° 24.5′ Long. 119° 54′ (82E/5W)
OSOYOOS M.D. Between 4,700 and 6,400 feet elevation on the northeast slope of Beaconsfield Mountain, 18 miles west of Penticton.

CLAIMS: JJ 1 to 32.

ACCESS: By the Apex Mountain road from Penticton, 20 miles.

OWNER: NEW NORTHCAL MINES LTD., 420, 475 Howe Street, Vancouver 1.

WORK DONE: Preliminary surface geological mapping, 1 inch equals 200 feet; ground magnetometer survey, 17 line-miles covering JJ 7-10, 18, 20-26, 28, 30, 32.

REFERENCE: Assessment Report 3916.

LYNX (No. 61, Fig. A)

LOCATION: Lat. 49° 23.1′ Long. 119° 20.4′ (82E/6W)
OSOYOOS and GREENWOOD M.D. At approximately 6,000 feet elevation on Allendale Lake, 12 miles east of Okanagan Falls.

CLAIMS: LYNX 1 to 31, TED 1 to 15, OTTER 1 to 20, BONANZA 1 to 32, BUSH 1 and 2.

ACCESS: By road from Okanagan Falls, 12 miles.

(82E/6E)

OPERATOR: SELCO MINING CORPORATION LTD., 6th Floor, 55 Yonge Street, Toronto, Ont.

METAL: Copper.

DESCRIPTION: The prospect is centred on an oval Coyrell syenite plug some 6 square miles in total area containing disseminated copper mineralization.

WORK DONE: Surface diamond drilling, two holes totalling 554 feet on Lynx 3.

REFERENCE: B.C. Dept. of Mines & Pet. Res., G.E.M., 1971, p. 386.

FUR, FLO, FILL (No. 60, Fig. A)

LOCATION: Lat. 49° 22.5' Long. 119° 06.7' (82E/6E)
GREENWOOD M.D. On the West Kettle River, 4 miles south of Beaverdell.

CLAIMS: FUR, FLO, FILL, DOORN, RON, DIP, GOFUR, PLAN, etc., totalling approximately 119.

OWNER: ARGENTIA MINES LTD., 205, 1460 Pandosy Street, Kelowna.

METALS: Copper, lead, zinc.

DESCRIPTION: This is essentially a porphyry-type occurrence with sulphide disseminations occurring in granodiorite near porphyry dykes and granite porphyry. Copper, lead, and zinc with gold and silver are the chief metals of interest. Quartz veins with gold and silver and chalcopyrite mineralization are found nearby.

WORK DONE: Road construction, 3 miles; trenching, 12,000 feet; stripping, 4,000 square yards.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, pp. 385, 386.

HIGHLAND BELL MINE (No. 186, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 26.1' Long. 119° 03.6' (82E/6E)
GREENWOOD M.D. The property is on the west slope of Mount Wallace, about 1 mile east of Beaverdell.

CLAIMS: Fourteen recorded and 32 Crown-granted claims.

ACCESS: The property is serviced by several mining roads from Beaverdell.

OWNER: TECK CORPORATION LTD., 700, 1177 West Hastings Street, Vancouver 1; mine office, Beaverdell.

METALS: Silver, lead, zinc (production shown on Table I).

DESCRIPTION:

The detailed geology of this property may be found in the Annual Report of the Minister of Mines for 1949. In summary, the occurrence may be described as highly faulted, moderate to steeply southward-dipping quartz veins and stringer lodes striking east to northeasterly in zones of altered granodiorite or sodic granite, part of a stock which intrudes the Westkettle batholith, west of the summit of Mount Wallace. The quartz veins are mineralized with pyrite, sphalerite, and galena with small amounts of silver. Parts of the veins contain silver minerals such as tetrahedrite, pyrargyrite, polybasite, argentite, and native silver. In these areas ore shoots have been developed.

(82E/6E)

WORK DONE:

Mining is done by open stope methods using jackleg drills and small air-powered slushers. Production, which amounts to about 100 tons per day, is hauled by trains to surface bins and then by truck to the mill in Beaverdell. Exploration was limited to diamond drilling only, with this work directed mainly toward finding extensions of known ore zones. At the concentrator, the ore is crushed, hand sorted, and finally concentrated by selective flotation, producing lead and zinc concentrates. Tailings are deposited adjacent to the mill on nearby river flats.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1949, pp. 138-148; Reinecke, L. (1915), Ore Deposits of the Beaverdell Map-Area, *Geol. Surv., Canada*, Mem. 79; *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 385.

HOPE, MB (No. 56, Fig. A)

LOCATION: Lat. 49° 27.5′-30′ Long. 119° 03.5′-05′ (82E/6E)
GREENWOOD M.D. On King Solomon Mountain and Horse Creek, between West Kettle River and Beaverdell Creek.

CLAIMS: HOPE 1 to 18, MB 1 to 10, 13 to 22.

ACCESS: By road from Beaverdell, 2 miles.

OWNER: GREENFIELDS DEVELOPMENT CORPORATION LTD., 530 Howe Street, Vancouver 1.

WORK DONE: Line-cutting.

REFERENCE: Assessment Report 4038.

FUKI (No. 11, Fig. A)

LOCATION: Lat. 49° 32.4′ Long. 118° 52.9′ (82E/7W, 10W)
GREENWOOD M.D. At elevations of 3,800 to 4,500 feet on Dear Creek, approximately 33 air-miles east of Penticton and 11 miles northeast of Beaverdell.

CLAIMS: FUKI, DONEN, totalling 145.

ACCESS: By road from Beaverdell, approximately 15 miles.

OWNER: Nissho-Iwai Canada Ltd.

OPERATOR: POWER REACTOR AND NUCLEAR FUEL DEVELOPMENT CORPORATION, 1-9-13, Akasaka Minatoku, Tokyo, Japan.

METAL: Uranium.

DESCRIPTION: Uranium occurs mainly in fluvial beds consisting of conglomerate, sandstone, and carbonaceous shale underlying a Tertiary plateau basalt formation.

WORK DONE: Road construction, 3.1 miles (area of Donen 281-360); surface diamond drilling, 16 holes totalling 3,431 feet on Donen 287-289, 293-295, 305-308, and 316.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 396; Assessment Report 3775.

WEWA (No. 35, Fig. A)

LOCATION: Lat. 49° 16′-18.5′ Long. 118° 00.2′-01.2′ (82E/8E)
TRAIL CREEK M.D. At the headwaters of Big Sheep Creek, 16 miles west of Castlegar.
CLAIMS: WEWA 1 to 40.
ACCESS: By Highway 3 from Castlegar, approximately 16 miles.
OWNER: R. M. REININGER, 205, 122 East 14th Street, North Vancouver.
WORK DONE: Geochemical and magnetometer surveys during 1971.
REFERENCE: Assessment Report 3802.

KINGFISHER (No. 23, Fig. A)

LOCATION: Lat. 49° 33.8′ Long. 118° 21.4′ (82E/9W)
GREENWOOD M.D. At 4,000 feet elevation between Mount Franklin and Burrell Creek, 45 miles north of Grand Forks.
CLAIMS: KINGFISHER, DODGE, PAR, MM 4, 6, 8 (formerly MAPLE LEAF).
ACCESS: By road from Grand Forks, 45 miles.
OPERATOR: DEWAIN M. COX, Box 1165, Fabens, Texas 79838.
METALS: Copper, silver, gold, lead, zinc, cadmium.
DESCRIPTION: Quartz vein ore and disseminated ore occur in feldspar porphyry.
WORK DONE: Geochemical soil survey, 86 samples covering four claims.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 399; *Geol. Surv., Canada*, Mem. 56, pp. 154, 173; Assessment Report 3717.

IVY, CAPCO, MAY (No. 8, Fig. A)

LOCATION: Lat. 49° 29.0′ Long. 119° 08.8′ (82E/11E, 6E)
GREENWOOD M.D. Between 3,000 and 4,500 feet elevation near Carmi, 8 miles northwest of Beaverdell.
CLAIMS: IVY, MARY-O, CAPCO, MAY (Lot 2355), etc., totalling approximately 324.
ACCESS: By road from Beaverdell, 8 miles.
OPERATORS: HUSKY OIL LTD., 815 Sixth Street West, Calgary, Alta. and G. V. LLOYD EXPLORATION LTD., 703 Fifth Street SW., Calgary, Alta.
METALS: Molybdenum, copper.
DESCRIPTION: Molybdenite with minor pyrite, chalcopyrite, and associated fluorite occurs in a breccia pipe within the contact zone of a Cretaceous granodiorite.
WORK DONE: Geological, geochemical, and magnetometer surveys during 1971.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 408 (Carmi); Assessment Reports 3562, 3740.

HED (No. 92, Fig. B)

LOCATION: Lat. 49° 30′-33′ Long. 119° 59′ (92H/9E; 82E/12W)
120° 03′
Report on this property in section 92H/9E.

KEN (No. 126, Fig. A)

LOCATION: Lat. 49° 31.5' Long. 119° 33' (82E/12E)
OSOYOOS M.D. On Mount Campbell, 2 miles west of Penticton.
CLAIMS: KEN 1 to 7.
ACCESS: By road from Penticton, 2 miles.
OWNER: ECHO BAY MINING LTD., 540 Minoru Blvd., Richmond.
WORK DONE: Line-cutting.
REFERENCE: Assessment Report 4039.

SID, KC (No. 118, Fig. A)

LOCATION: Lat. 49° 46' Long. 119° 49.5' (82E/12W, 13W)
OSOYOOS M.D. At approximately 2,400 feet elevation east of the Brenda mine road and south of the Brenda mine, 3.5 miles west of Peachland.
CLAIMS: SID 1 to 14, KC 1 to 20.
ACCESS: By the Brenda mine road from Peachland, 3.5 miles.
OWNERS: Index Mines Ltd. and Huntsman Resources Ltd.
OPERATOR: H. F. KENWARD, 305, 543 Granville Street, Vancouver 2.
METALS: Copper, molybdenum.
DESCRIPTION: A granodiorite intrusive is sheared and cut by quartz vein systems. Blebs of bornite, native copper, and molybdenite were noted in drill cores.
WORK DONE: Surface diamond drilling, four holes totalling 238 feet on Sid 2 and 3.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 392.

BLUEBELL (No. 125, Fig. A)

LOCATION: Lat. 49° 48.3' Long. 119° 50' (82E/13W)
OSOYOOS M.D. East of Peachland Creek and immediately south of Silver Lake, 8 miles northwest of Peachland.
CLAIMS: KNOB 1 to 30, ELK 1 to 4, JUDY 1 and 2.
ACCESS: By logging road from Peachland, approximately 8 miles.
OPERATOR: CANADIAN JOHNS-MANVILLE COMPANY LIMITED, Box 1500, Asbestos, P.Q.
METALS: Copper, zinc.
DESCRIPTION: Pyrrhotite, chalcopyrite, sphalerite, and magnetite occur as lenses and pods in limestone beds.
WORK DONE: Geological mapping, 1 inch equals 1,000 feet; magnetometer survey; reconnaissance and detailed geochemical survey.
REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1964, p. 103; Assessment Report 4040.

ROHANNA (No. 21, Fig. A)

LOCATION: Lat. 49° 47.6'-48.9' Long. 119° 42.5'-44.2' (82E/13E)
OSOYOOS M.D. On Trepanier Creek, 1.5 miles north-northwest of Peachland.

(82E/13E)

CLAIMS: ROHANNA 15 to 24, 29 to 39, KEL 10 to 17, ZN 1 to 18.
ACCESS: By road from Peachland, 1.5 miles.
OWNER: VEGA MINES LTD., 1250, 505 Burrard Street, Vancouver 1.
METALS: Copper, zinc.
WORK DONE: Line-cutting and geochemical soil sampling on Rohanna 15-22 and 29-32.
REFERENCE: Assessment Report 3641.

BLUE HAWK (No. 44, Fig. A)

LOCATION: Lat. 49° 59.0' Long. 119° 31.0' (82E/13E)
VERNON M.D. At approximately 3,000 feet elevation on the west side of Okanagan Lake, 1 mile west of Wilson Landing.
CLAIMS: HILL 1 to 6, RJ 1 to 4, TOWER 1 to 7, FRIDAY 1 to 6, BLUE 1 and 2.
ACCESS: By logging road from Wilson Landing, 1 mile.
OWNER: DAWOOD MINES LIMITED, Box 1499, Merritt.
METALS: Gold, silver.
DESCRIPTION: Gold and silver mineralization occurs in scattered veins of shattered, vitreous quartz in Cache Creek sedimentary rocks and greenstones which are intruded by dioritic rocks. The veins vary from a few inches to a few feet in width. Mineralization consists of pyrite, a little galena, and dark oxide minerals.
WORK DONE: Surface geological mapping, 1 inch equals 200 feet and geochemical soil survey, 291 samples covering Hill 1-6 and RJ 1 and 2.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 299 (Spike); Assessment report 3934.

PB (No. 12, Fig. A)

LOCATION: Lat. 49° 55.5'-58.3' Long. 118° 53.6'-58.5' (82E/15W)
VERNON M.D. Between 5,300 and 6,100 feet elevation on Pearson Creek, approximately 25 air-miles east of Kelowna.
CLAIMS: PB 1 to 80.
ACCESS: By road from Kelowna, approximately 40 miles.
OWNER: Nissho-Iwai Canada Ltd.
OPERATOR: POWER REACTOR AND NUCLEAR FUEL DEVELOPMENT CORPORATION, 1-9-13, Akasaka, Minatoku, Tokoyo, Japan.
DESCRIPTION: A thick carbonaceous sediment was found below Tertiary plateau basalts near the bottom of a paleostream channel.
WORK DONE: Ground radiometric survey, 18 line-miles and geochemical survey, 24 water samples covering PB 1-80; surface diamond drilling, five holes totalling 1,405 feet on PB 2, 27, 30, 59, and 63.
REFERENCE: Assessment Report 3745.

NELSON 82F

COLD (No. 59, Fig. A)

LOCATION: Lat. 49° 06′ Long. 116° 19′ (82F/1W)
FORT STEELE and NELSON M.D. At approximately 6,200 feet elevation at the headwaters of Russell Creek, 4.5 miles south of Kitchener.

CLAIMS: COLD 1 to 20.

ACCESS: By four-wheel-drive vehicle road from Highway 3 at Kitchener, 4.5 miles.

OWNER: COMINCO LTD., Box 2000, Kimberley.

DESCRIPTION: The survey area is underlain by fine-grained laminated quartzites and argillites of the Precambrian Aldridge Formation.

WORK DONE: Surface workings mapped; magnetometer survey, 5.6 line-miles covering Cold 1, 3, 5-8; electromagnetic survey, 0.7 line-mile covering Cold 3, 5, 6; geochemical soil survey, 42 samples covering Cold 1, 2, 5, 6, 8-10, 12, 13, 15; road construction, 2 miles (from Russell Creek to claim group).

REFERENCES: Assessment Reports 4127, 4128.

INVINCIBLE, EAST DODGER (No. 167, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 06.8′ Long. 117° 13.2′ (82F/3E)
NELSON M.D. On Iron Mountain, adjacent to the Jersey mine and campsite.

CLAIMS: DODGER (Lot 12083) and INVINCIBLE (Lot 12084) Crown-granted claims and many adjoining mineral claims.

ACCESS: By 4 miles of gravel road which leaves the Salmo-Nelway Highway immediately south of Sheep Creek.

OWNER: CANEX PLACER LIMITED (formerly Canadian Exploration Limited), 700, 1030 West Georgia Street, Vancouver 5; mine office, Salmo.

METAL: Tungsten (production shown on Table I).

DESCRIPTION:

Tungsten mineralization, mainly scheelite, is disseminated in skarn marginal to igneous stocks. Ore zones in the Invincible have been described as 'flames' which originate near the granitic contacts and which gradually diminish as they proceed into the altered sedimentary rocks. Molybdenum, found with the scheelite as either molybdenite or powellite, gives rise to milling problems.

WORK DONE:

Mining is done by jackleg slashing and scraper mucking to loading points where trackless equipment transports the ore to the crusher ore passes. Production of about 500 tons per day came from the new Invincible mine as well as from the reopened East Dodger mine.

Concentration of tungsten ore is rather complicated and involves flotation, gravity concentration, leaching, and roasting to produce a concentrate of acceptable quality. The final product is placed into reinforced plywood cases, each of which holds about a ton of material.

The ore is most irregular and hence difficult to mine. Ore reserves are also difficult to estimate.

REFERENCES: *B.C. Dept. of Mines,* Bull. 41, 1959, p. 111; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 401.

HB MINE (No. 168, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 08.9' Long. 117° 12.1' (82F/3E)
NELSON M.D. The property is on the north side of Sheep Creek, 7 miles by road from Salmo.
CLAIMS: GARNET (Lot 10809), ZINCTON (Lot 10810), and many other Crown-granted and recorded mineral claims.
ACCESS: By road along the north side of Sheep Creek.
OWNER: COMINCO LTD., Trail; mine office, Salmo.
METALS: Lead, zinc.
DESCRIPTION:

The HB orebodies lie within the Reeves limestone in folds which plunge gently to the south. The No. 1 ore zone is remarkably consistent and has been mined over a length of 2,000 feet with a maximum cross section of 450 feet in height and 100 feet in width. Mineralization consists of sphalerite and pyrite with minor galena found in narrow bands and lenses in dolomite.

WORK DONE:

The HB mine operated from 1949 until the fall of 1966 when depressed zinc prices brought about the closure of the operation. Since ore reserves were not exhausted at the time of closure, the mill was not stripped and the surface plant was maintained by a watchman.

Cominco Ltd. decided to reopen the mine and work commenced on mill and underground rehabilitation in the fall of 1972. There is an estimated three-year ore reserve left in the mine.

REFERENCES: *B.C. Dept. of Mines,* Bull. 41, 1959, p. 101; *Minister of Mines, B.C.,* Ann. Rept., 1966, p. 213.

SHEEP CREEK CAMP (No. 191, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 09' Long. 117° 09' (82F/3E)
NELSON M.D. The Sheep Creek Camp is situated on Sheep Creek, about 5 miles from the Salmo-Nelway Highway.
CLAIMS: RENO (Lot 12684), QUEEN (Lot 1076), BURLINGTON (Lot 1079) Crown-granted and several recorded claims.
ACCESS: Via the Sheep Creek mining road from the Salmo-Nelway Highway.
OWNERS: J.A.C. ROSS, D. R. SIMMONS, L. MUTO, and others.
METALS: Gold, silica.
WORK DONE: Quartzite is used as a flux at the Trail smelter and is also sorted for flagstones. About 30,000 tons of quartzite slide material was purchased

(82F/3W)

by Cominco Ltd. during the year. Some road building was done to provide access to talus slopes. Excavating was done with front-end loaders with most material being shipped directly to Trail. A crusher was used on material obtained from upper Sheep Creek.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 400.

ANNEX MINE **(No. 169, Fig. A)** By P. E. Olson

LOCATION: Lat. 49° 00.8' Long. 117° 22.3' (82F/3W)
NELSON M.D. The mining properties lie on both sides of the Pend-d'Oreille River west of Nelway.

CLAIMS: Many Crown-granted and recorded claims stretching from the United States border to north of Remac.

ACCESS: By mining roads from Remac.

OWNER: REEVES MacDONALD MINES LIMITED, Remac.

METALS: Lead, zinc (production shown on Table I).

WORK DONE:

All production came from the Annex mine except for some salvage from the Reeves MacDonald mine. The ore zones are developed by slashed-out sublevels on 25-foot intervals with the resultant pillars being broken by long-hole methods. Ore is scraped to ore passes in scram drifts and is transported by train to ore pockets near the Annex shaft. From the shaft head, which is underground, the ore is again loaded into trains and hauled to a surface dump. A front-end loader and truck are then used to haul the ore to the mill.

A new ore zone was encountered near the north end of the 1000 level, and subsequent exploration showed that the ore was faulted above this level but continued down for some distance at least. To intersect this new zone at depth the 240 level in the Reeves MacDonald mine was driven southerly to a point about 750 feet below the Annex workings where it had arrived by the end of 1972.

The mill operated throughout the year at about half capacity.

With ore reserves at the Annex dropping off, it was decided to underhand mine the bottom section of the Annex ore zone using scooptrams and jackleg slashing.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 401 (Reeves MacDonald mine); p. 402 (Annex).

BLUE BIRD **(No. 57, Fig. A)** By P. E. Olson

LOCATION: Lat. 49° 03.5' Long. 117° 47.5' (82F/4W)
TRAIL CREEK M.D. At approximately 2,900 feet elevation 1 mile south of Rossland.

CLAIMS: BLUE BIRD (Lot 1053), COPPER QUEEN (Lot 1210), OLLA PODRIDA (Lot 799).

ACCESS: By road from Rossland, 1.5 miles.

OWNER: Ross Island Mining Co. Ltd.

OPERATOR: STANDONRAY MINES LTD., 3567 West 27th Avenue, Vancouver 8.

(82F/4W)

METALS: Gold, silver, lead, zinc (production shown on Table I).

DESCRIPTION: The Blue Bird structures strike northerly and dip steeply to the east and lie mainly within cherty rocks of the Mount Roberts Formation. The vein is narrow but contains appreciable amounts of lead and zinc with associated gold and silver. Sulphides identified include galena, sphalerite, stibnite, pyrite, arsenopyrite with quartz.

WORK DONE: Underground workings were mapped at a scale of 1 inch equals 40 feet. A semiportable mill was erected near No. 2 level portal on the Blue Bird, and was ready to operate by the end of the year. About 2,000 tons of ore was broken in the mine in readiness for milling. The operators plan on pumping tailings into abandoned mine workings. A small shipment of ore was sent to the Trail smelter.

References: *Geol. Surv., Canada,* Mem. 77, 1915, pp. 160-161; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 315.

SNOWDROP **(No. 55, Fig. A)**

LOCATION: Lat. 49° 04.6′ Long. 117° 50.2′ (82F/4W)
TRAIL CREEK M.D. At approximately 3,500 feet elevation west of Rossland, one-half mile east of O.K. Hill.

CLAIMS: SNOWDROP (Lot 3513), GOLD KING (Lot 1229), CONCORDIA (Lot 2943), SNOWDROP Fraction.

ACCESS: By road from Rossland, 1.5 miles.

OPERATOR: STANDONRAY MINES LTD., 3567 West 27th Avenue, Vancouver 8.

METAL: Gold.

DESCRIPTION: Narrow quartz veins occur mainly in massive volcanic rocks.

WORK DONE: Underground geological mapping, 1 inch equals 40 feet; road construction, one-half mile; drifting, 35 feet; underground diamond drilling, five holes totalling 233 feet, all on the Snowdrop.

REFERENCE: *Minister of Mines, B.C.* Ann. Rept., 1956, p. 76.

COXEY MINE **(No. 142, Fig. A)** By P. E. Olson

LOCATION: Lat. 49° 05.3′ Long. 117° 49.6′ (82F/4W)
TRAIL CREEK M.D. Between 4,500 and 5,000 feet elevation on the west slope of Red Mountain, 2 miles west of Rossland.

CLAIMS: Eighteen claims and two mineral leases. The principal claim is the COXEY (Lot 1221).

ACCESS: By a gravel road which leaves the old Cascade Highway about 1 mile west of Rossland.

OWNERS: RED MOUNTAIN MINES LIMITED (THE INTERNATIONAL NICKEL COMPANY OF CANADA, LIMITED), Box 44, Toronto-Dominion Centre, Toronto, Ont. and CONSOLIDATED CANADIAN FARADAY LTD., Box 849, Rossland.

METAL: Molybdenum (production shown on Table I).

(82F/6W)

DESCRIPTION: Molybdenite occurs in skarny argillite of the Mount Roberts Formation and in an adjacent brecciated granodiorite porphyry dyke. The ore occurs as poorly defined pods within a stratified zone of brecciation.

WORK DONE:

Mining and milling ceased on January 7, 1972, after which the platn was cleaned and a watchman left at the site. Some reclamation work was done prior to closing, and subsequent reclamation was slowed to stretch over a three-year period to assess results.

The geology of the workings was mapped at a scale of 1 inch to 50 feet. A geochemical survey was conducted and one hole diamond drilled.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1966, pp. 200-208; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 403.

PORTO RICO, SPOTTED HORSE (No. 183, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 19.1′-19.8′ Long. 117° 18.4′-19.6′ (82F/6W)
NELSON M.D. The property is near the head of Barrett Creek, a tributary of the Salmo River from the west.

CLAIMS: PORTO RICO (Lot 2385), SPOTTED HORSE (Lot 5375), and several other adjoining Crown grants.

ACCESS: By mining road from the Nelson-Ymir Highway.

OPERATOR: MURRAY ZULPS, Nelson.

WORK DONE: The Barrett Creek road to the property was repaired and dumps were sampled. A small gravity concentrator was purchased and taken to the property but was not put into operation.

REFERENCE: *Minister of Mines, B.C.,* Ann. Rept., 1944, p. 62.

MAMMOTH (No. 115, Fig. A)

LOCATION: Lat. 49° 21.5′ Long. 117° 17′ (82F/6W)
NELSON M.D. At approximately 5,000 feet elevation between Hall and Barrett Creeks, at the head of Keno Creek, 9 miles south of Nelson.

CLAIMS: MAMMOTH, MAMMOTH 1 and 2 (Lots 14692 to Lot 14694), MAMMOTH Fraction and MAMMOTH 4 and 3 (Lots 15034 to Lot 15036), TNT (Lot 14695), TNT Fraction (Lot 14880), GRACE 1 to 10, PYGMY 15 and 16.

ACCESS: By Highway 6 and logging road from Nelson, 12 miles.

OWNERS: Welland Consolidated Mining Ltd. and Grace Brander.

OPERATORS: WELLAND CONSOLIDATED MINING LTD., 543 Granville Street, Vancouver 2 and PECHINEY DEVELOPMENT LIMITED, 701, 744 West Hastings Street, Vancouver 1.

METALS: Molybdenum, copper, silver, gold.

DESCRIPTION: Mineralization occurs disseminated and along fracture planes in hornfels.

WORK DONE: Magnetometer survey, 10 line-miles; geochemical soil survey, 147 samples.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1968, p. 240; Assessment Reports 4034, 4035.

REFERENDUM (No. 7, Fig. A)

LOCATION: Lat. 49° 25.7′ Long. 117° 23.5′ (82F/6W)
NELSON M.D. On Porter Creek, 6 miles southwest of Nelson.
CLAIMS: REFERENDUM (Lot 4387), KATIE (Lot 4386), GOLDEN CROSS (Lot 4388).
ACCESS: By road from Nelson, 6 miles.
OWNER: M. L. CRAIG, 2208 West Dean, Spokane, Washington.
WORK DONE: Geochemical soil survey, 213 samples during 1971.
REFFERENCE: Assessment Report 3533.

EUPHRATES (No. 26, Fig. A)

LOCATION: Lat. 49° 23.1′ Long. 117° 12.5′ (82F/6E)
NELSON M.D. The property is on the Nelson-Ymir Highway, about 9 miles south of Nelson.
CLAIMS: PIA 1 to 10, EVA 1 to 9, MIKE 1 to 8, A 1 to 8, PETE 1 to 5, CONTACT 1 to 6, ACE 1 to 4.
ACCESS: By Highway 6 from Nelson, 9 miles.
OWNER: ROBERT MINES LTD., 2050, 777 Hornby Street, Vancouver 1.
METALS: Gold, silver, lead, zinc, tungsten.
DESCRIPTION: Northwesterly trending quartz veins have been mined intermittently, mainly at the Euphrates and the Golden Age mines. Mineralization occurs in andesite and augite porphyry.
WORK DONE: Underground geological mapping, 1 inch equals 20 feet on Pia 7; road construction, 600 feet; stripping, 40,000 square feet mostly on A 1-4; surface diamond drilling, two holes totalling 142 feet on A 2 and two holes totalling 110 feet on Pia 7.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 404.

ICE (No. 155, Fig. A)

LOCATION: Lat. 49° 20′ Long. 116° 06′ (82F/8E)
FORT STEELE M.D. Near Cooper Lake, 12 miles west of Moyie Lake and 19.5 miles southwest of Cranbrook.
CLAIMS: ICE 1 to 24.
ACCESS: By secondary road from Cranbrook.
OWNER: COMINCO LTD., Box 2000, Kimberley.
WORK DONE: Magnetometer survey, 7 line-miles and electromagnetic survey, 0.8 line-mile.
REFERENCE: Assessment Report 4131.

HOT (No. 58, Fig. A)

LOCATION: Lat. 49° 16′ Long. 116° 05′ (82F/8E)
FORT STEELE and NELSON M.D. At approximately 6,700 feet elevation at the headwaters of Lewis and Irishman Creeks, 22 miles northeast of Creston.

(82F/9E)

CLAIMS: HOT 1 to 24.

ACCESS: By logging road from Highway 3 at Kid Creek, 17 miles.

OWNER: COMINCO LTD., Box 2000, Kimberley.

DESCRIPTION: Rocks underlying the survey area are fine-grained, laminated quartzites and argillites of the Aldridge Formation of Late Precambrian age. A gabbro intrusion occurs in the survey area.

WORK DONE: Magnetometer survey, 5.66 line-miles covering Hot 6-10, 17, 19; electromagnetic survey, 0.75 line-mile covering Hot 8-10; line-cutting, 5.66 line-miles covering Hot 6-10, 17, 19.

REFERENCE: Assessment Report 4129.

JIM (No. 54, Fig. A)

LOCATION: Lat. 49° 32.8' Long. 116° 07.5' (82F/9E)
FORT STEELE M.D. At approximately 6,000 feet elevation on the east side of Angus Creek, 5 miles southeast of the east end of St. Mary Lake, 20 miles southwest of Kimberley.

CLAIMS: JIM 1 to 8.

ACCESS: By road from Kimberley, 20 miles.

OWNER: Supertest Investments and Petroleum Limited.

OPERATOR: BPOG OPERATIONS LTD., 335 Eighth Avenue SW., Calgary, Alta.

DESCRIPTION: The claims are underlain by argillaceous quartzite, quartzite, and argillite of the Creston Formation near a granodiorite and quartz diorite intrusion.

WORK DONE: Magnetometer survey, 12 line-miles covering Jim 1-8.

POLARIS (No. 37, Fig. A)

LOCATION: Lat. 49° 36.8' Long. 116° 01' (82F/9E)
FORT STEELE M.D. Between 3,000 and 5,000 feet elevation south of the St. Mary River, 12 miles northwest of the St. Mary River.

CLAIMS: POLARIS, RIGEL, MOLOCH, THREEFINGERS, totalling 186.

ACCESS: By road from Cranbrook, 15 miles.

OWNER: Texasgulf Inc.

OPERATOR: ECSTALL MINING LIMITED, 701, 1281 West Georgia Street, Vancouver 5.

METALS: Lead, zinc.

WORK DONE: Surface geological mapping, 1 inch equals 500 feet covering Rigel, Moloch, and Threefingers; geochemical soil survey, six samples on the Polaris; 8 miles of tractor stipping for drill-site preparation, road construction, and road rehabilitation.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 405, 406.

LATE (No. 27, Fig. A)

LOCATION: Lat. 49° 38'-41.5' Long. 116° 01'-05.8' (82F/9E)
FORT STEELE M.D. On the south slope of North Star Hill, 6 miles west of Kimberley.

(82F/9E)

CLAIMS: LATE 1 to 91.
ACCESS: By secondary road and logging road from Kimberley, 6 miles.
OWNER: COMINCO LTD., Box 2000, Kimberley.
WORK DONE: Electromagnetic survey during 1971.
REFERENCE: Assessment Report 3621.

SULLIVAN MINE (No. 171, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 42.0' Long. 116° 00.7' (82F/9E)
FORT STEELE M.D. The operations in and about the Sullivan mine lie within the city limits of Kimberley.
CLAIMS: The company owns 680 Crown-granted claims and fractions and 562 recorded claims.
ACCESS: Via several roads from the highway at Kimberley.
OWNER: COMINCO LTD., 1199 West Pender Street, Vancouver; mine office, Kimberley.
METALS: Silver, lead, zinc (production shown on Table I).
WORK DONE:

The following information was supplied by Cominco Ltd.

During 1972, about 1,925,099 tons of Sullivan ore was treated at the concentrator. The concentrator operated 226 days during 1972.

Development driven totalled approximately 20,300 feet and underground diamond drilling about 4,200 feet. Backfill totalled 516,078 cubic yards of float, rock, and cave.

The ventilation system handled approximately 950,000 cubic feet per minute of air. Intake air heating plants at Nos. 1, 41, and 24 shafts operated from October 1971 to April 1972 with a combined output of 32 million Btu per hour (natural gas). The amount of mine air heated is approximately 650,000 cubic feet per minute.

Oxidation became evident in one producing pillar in December. The area has been isolated from the regular mine ventilation network and exhausts directly to surface via Nos. 31, 34, and 42 shafts.

Application of rock-mechanic techniques to improve mining methods continued.

TECHNICAL DEVELOPMENT

General: The Sullivan Mine Technical Development Department provided services to other mines and divisions within Cominco, and was involved in cooperative ventures with other companies and government agencies.

Rock Drilling: A method for drilling blastholes up to 3-inch bore, using diamond drills designed to operate inside 7 feet of working room, was evolved. Progress was made on development of small jumbos for use with percussion drills in two activities – for mounting blasthole drills inside 7 feet of working room, and for a drilling system to replace jacklegs.

Explosives: Extensive operational trials of slurry blasting agents in underground operations were conducted as part of a continuing process of evaluation of technical progress with these explosives. Bulk tests on ammonium nitrate were conducted in cooperation with Canadian Explosives Research Laboratories to evolve standards for shipping classification for ammonium nitrate which could be used by the Railway Transport Commission.

Backfilling: Pneumatic conveying equipment developed in cooperation with Radmark Engineering Limited for backfilling at the Sullivan mine was used successfully for suppression of a coal-mine fire at Kaiser Resources Ltd.'s Balmer South hydraulic mine. Work is in progress aimed at evaluating the hoisting and longitudinal potentials for the system.

Sampling: A machine for face sampling to replace manual chip sampling was developed in cooperatio with J. K. Smit and Sons Diamond Products Ltd. and Atlas Copco (Canada) Ltd. The latter is preparing to market the device for the three organizations.

Hearing Conservation: A system for mounting ear muffs on hard hats in conjunction with other protective devices, such as safety glasses and chin straps, required in underground working conditions was developed in cooperation with MSA Canada Ltd. The latter is now marketing the system.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 405.

WD (No. 2, Fig. A)

LOCATION:	Lat. 49° 44.5′ Long. 116° 20.0′ (82F/9W, 16W) FORT STEELE M.D. One mile from the junction of White and Dewar Creeks, 17.5 miles west-northwest of Kimberley.
CLAIMS:	WD 1 to 16.
ACCESS:	By road from Kimberley, 17.5 miles.
OWNER:	COMINCO LTD., Box 2000, Kimberley.
WORK DONE:	A geochemical survey was done on WD 7-16 during 1971.
REFERENCE:	Assessment Report 3498.

UNITED COPPER (No. 52, Fig. A)

LOCATION:	Lat. 49° 43.5′ Long. 116° 36′ (82F/10E) SLOCAN and FORT STEELE M.D. Between 6,500 and 7,200 feet elevation at Cogle Pass, 12 miles northeast of Crawford Bay.
CLAIMS:	UNITED COPPER 2, 3, 9 to 12, LIMESTONE 3 to 8, 10 to 12, 14 to 16.
ACCESS:	By four-wheel-drive vehicle road from Crawford Bay, 15.5 miles.
OWNER:	COGLE COPPER LIMITED, 704 Railway Street, Nelson.
METALS:	Copper, silver, lead, zinc.
DESCRIPTION:	Quartz veins and inclusions containing chalcopyrite, sphalerite, galena, pyrite, and pyrrhotite occur along a shear zone and in foliated zones in chlorite schist. Bornite, with silver minerals, occurs as replacements in limestone.
WORK DONE:	Surface diamond drilling, four holes totalling 240 feet on United Copper 2.
REFERENCE:	*B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 406.

(82F/10W)

HUMBOLT (No. 53, Fig. A)

LOCATION: Lat. 49° 45.2' Long. 116° 38' (92F/10E, 15E)
SLOCAN and FORT STEELE M.D. Between 5,200 and 6,400 feet elevation on Spring Creek, in Crawford Creek basin, 6 miles east of Riondel.

CLAIMS: HUMBOLT (Lot 2015), SAILOR BOY (Lot 2016), JOAN 1 to 71, SILVER 5 to 8, HOPE 1 to 4, BAREFOOT 1 and 2, DARI 1 and 2, ELLEN 1 to 3, GEM, GEM Fraction, VI 1 to 8, HOPE 2 to 6, ELEANOR.

ACCESS: By road from Crawford Bay, 14 miles.

OWNER: ROSE PASS MINES LTD., 630A – 17th Avenue SW., Calgary, Alta.

METALS: Silver, lead, zinc.

DESCRIPTION: Quartz veins in black argillaceous rocks contain galena, sphalerite, chalcopyrite, stannite, and pyrite.

WORK DONE: Surface diamond drilling, five holes totalling 963 feet on Barefoot 2, Ellen 3, and Silver 7.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 406.

CRAW (No. 116, Fig. A)

LOCATION: Lat. 49° 38.2'-40' Long. 116° 49.8'-51' (82F/10W)
SLOCAN M.D. Between Crystal and McGregor Lakes, on the west side of Crawford Bay on Kootenay Lake.

CLAIMS: CRAW 1 to 31.

ACCESS: By road from Nelson, approximately 25 miles.

OWNER: COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 5.

DESCRIPTION: The claim group is underlain by schists of the Index Formation, Hamill quartzites and amphibolites and granitic intrusive rocks.

WORK DONE: Geochemical soil survey, approximately 500 samples covering Craw 1-4, 9-16, 20-30.

REFERENCE: Assessment Report 4132.

OTTAWA (No. 172, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 47.4' Long. 117° 24' (82F/14W)
SLOCAN M.D. On the north side of Springer Creek, 5 miles from Slocan.

CLAIMS: OTTAWA (Lot 4968) plus other mineral claims.

ACCESS: By the Springer Creek mining road which leaves the Slocan-Nelson Highway one-half mile south of Slocan.

OPERATOR: PAMICON DEVELOPMENTS LTD., c/o Mike Poznikoff, Slocan.

METAL: Silver (producton shown on Table I).

WORK DONE: Mike Poznikoff and partners produced several cars of sorted ore which were sent to the Trail smelter. Both 8 and 9 levels were worked but increasing amounts of development and exploration work became necessary and thus reduced the overall earnings of the operators.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 411.

(82F/14W)

REPUBLIC (No. 137, Fig. A)

LOCATION: Lat. 49° 48′ Long. 117° 27′ (82F/14W)
SLOCAN M.D. At approximately 4,000 feet elevation near the head of Climax Creek, 2 miles north of Slocan.
CLAIMS: REPUBLIC NO. 2 (Lot 5498) and eight adjoining Crown grants; ROSS 1 to 14.
ACCESS: By road along Climax Creek from Slocan, 6 miles.
OWNER: TANDEM RESOURCES LTD., 5316 Fleming Street, Vancouver 15.
METALS: Silver, lead, zinc, gold.
DESCRIPTION: Quartz veins cut porphyritic granite of the Nelson batholith.
WORK DONE: Surface geological mapping, 1 inch equals 100 feet covering Ross claims; road construction, 2,300 feet on Republic No. 2; drifting, 170 feet on Republic No. 2.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 411.

ENTERPRISE (No. 173, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 49.3′ Long. 117° 19.5′ (82F/14W)
SLOCAN M.D. The enterprise mine is on the south side of Enterprise Creek, about 4 miles from the Slocan-Silverton Highway.
CLAIMS: ENTERPRISE (Lot 1014) and other Crown grants.
ACCESS: By a good mining road along the north side of Enterprise Creek.
OWNER: Enterprise Silver Mines Ltd.
OPERATORS: W. WINGERT and L. FRIED, New Denver.
METALS: Silver, lead, zinc (production shown in Table I).
WORK DONE: Two leases were active between 5 and 6 levels. Hand-sorted ore was shipped to the Trail smelter and some low-grade ore was custom milled at Sandon.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 410.

SHADOW (No. 124, Fig. A)

LOCATION: Lat. 49° 56.5′ Long. 117° 20′ (82F/14W)
SLOCAN M.D. One-half mile east of Slocan Lake, southeast of Silverton.
CLAIMS: SHADOW, NORJACK, WINONA, totalling 25.
ACCESS: By road from Silverton.
OWNER: AMIGO SILVER MINES LTD., 16, 448 Seymour Street, Vancouver 2.
WORK DONE: Line-cutting and geochemical survey on Shadow 1-7, Shadow 2 Fraction, Norjack 1-4, and Winona 3-4.
REFERENCE: Assessment Report 4033.

SILMONAC (MINNIEHAHA) (No. 174, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 58.3′ Long. 117° 15.2′ (82F/14W)
SLOCAN M.D. One mile southwest of Sandon.

(82F/14W)

CLAIMS: Sixty-two Crown-granted mineral claims and three leases. Main workings are collared on the MINNIEHAHA (Lot 3170).

ACCESS: By good mining roads from Sandon.

OWNER: Silmonac Mines Ltd.

OPERATORS: KAM-KOTIA MINES LIMITED and BURKAM MINES LTD., New Denver.

METALS: Silver, lead, zinc (production shown on Table I).

WORK DONE:

Mining is done with jackleg drills and electric slushers since the ground is fairly competent and the ore zones fairly flat. Pillars left during mining were extracted on a retreating basis where their ore content justified extraction. Ore was hauled to a bin at the portal of the 4625 level and then trucked to the company mill which treated about 100 tons per day for about 250 days of the year. Tailings were deposited along Carpenter Creek behind substantial dykes. Some shrub planting was done along the permanent banks of the impoundments.

Ore reserves have dropped and the last mining of the year was mainly ore salvage basis. Exploration is continuing in an attempt to find further ore zones.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 408.

CENTENIAL SILVER (No. 28, Fig. A)

LOCATION: Lat. 49° 59.3' Long. 117° 21.0' (82F/14W)
SLOCAN M.D. On the south shore of Carpenter Creek, 1 mile southeast of New Denver.

CLAIMS: CENTENIAL SILVER 14, CPR (Lot 4871).

ACCESS: By all-weather road from New Denver.

OWNER: CONCEPT RESOURCES LTD. (formerly Canarctic Resources Ltd.), 3001, 504 Fourth Avenue SW., Calgary, Alta.

WORK DONE: Electromagnetic survey.

REFERENCE: Assessment Report 3692.

MOUNTAIN CHIEF (No. 45, Fig. A)

LOCATION: Lat. 49° 59.7' Long. 117° 20' (82F/14W)
SLOCAN M.D. On the south side of Carpenter Creek, 2 miles southeast of New Denver.

CLAIMS: MOUNTAIN CHIEF (Lot 474), MAMMOTH (Lot 1910), PET 1 to 4, 9 to 14, RT 1 to 4.

ACCESS: By road 1.5 miles up Carpenter Creek from Highway 6.

OWNER: NEW DENVER EXPLORATIONS LTD., 470 Granville Street, Vancouver 2.

METALS: Lead, zinc, copper.

DESCRIPTION: Sphalerite, galena, and chalcopyrite occur in quartz veins.

WORK DONE: Surface geological mapping, 1 inch equals 1,500 feet; electromagnetic survey, 2 line-miles; and geochemical survey, 1,500 samples covering all

(82F/14W)

claims; road construction, 1 mile; trenching, 2,500 feet on Pet claims; underground workings rehabilitated.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1929, pp. 316, 317; *Geol. Surv., Canada,* Mem. 184, p. 14; Assessment Report 3919.

VICTOR (No. 184, Fig. A)

By P. E. Olson

LOCATION: Lat. 50° 00.0′ Long. 117° 16.1′ (82F/14W; 82K/13W)
SLOCAN M.D. Immediately south of Three Forks.

CLAIMS: VICTOR (Lot 4564) plus a large block of adjoining Crown grants.

ACCESS: By 2 miles of mining road from Sandon.

OWNER: Kam-Kotia Mines Limited.

OPERATOR: GENE PETERSON, Sandon.

METALS: Silver, lead, zinc (production shown on Table I).

WORK DONE: Some mining and development work was done in the vicinity of No. 5 level. A small amount of hand-sorted ore was shipped to the Trail smelter.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 453.

SCRANTON (No. 175, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 47.3′ Long. 117° 03.6′ (82F/14E)
SLOCAN M.D. In Kokanee Glacier Park, near the head of Pontiac Creek, a tributary of Woodbury Creek from the south.

CLAIMS: SCRANTON (Lot 7452), GRANDVIEW (Lot 6279), and other Crown-granted and recorded claims.

ACCESS: By mining roads from the Ainsworth-Kaslo Highway along Woodbury Creek.

OWNER: SILVER STAR MINES LTD., 400, 837 West Hastings Street, Vancouver 2.

METALS: Gold, silver, lead, zinc.

WORK DONE: The road to the mine was repaired and widened in places. The buildings at the mining camp were partly demolished by winter snow.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 407.

INDEX (No. 119, Fig. A)

LOCATION: Lat. 49° 51′ Long. 117° 08′ (82F/14E)
SLOCAN M.D. At approximately 4,100 feet elevation on the east side of Keen Creek (south fork), 7.5 miles south of the Kaslo-New Denver Highway, 15 miles southwest of Kaslo.

CLAIMS: WHITEY 1 to 5, 7, DEX 1 and 2.

ACCESS: By road from Kaslo, 14.5 miles.

OWNER: ANDEX MINES LTD., 305, 543 Granville Street, Vancouver 2.

METALS: Silver, lead, zinc.

DESCRIPTION: Fissure veins and replacements occur in folded metasedimentary rocks near granitic rocks.

(82F/14E)

WORK DONE: Road construction, 1.5 miles (from Keen Creek to workings); trenching on Dex 2; rotary drilling, nine holes totalling 45 feet on Dex 2.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 408.

COMSTOCK (No. 114, Fig. A)

LOCATION: Lat. 49° 53.3' Long. 117° 14' (82F/14E)
SLOCAN M.D. Between Fennell and Silverton Creeks, 7 miles southeast of Silverton.

CLAIMS: COMSTOCK (Lot 1814), SILVER CHIEF (Lot 1813), RUBY TRUST (Lot 1804), KENTUCKY GIRL (Lot 1818), MURPH, MURPH 1 Fraction, RUTH, SUSAN, ISABELLE 1 and 2, 7 to 15.

ACCESS: By logging road from Silverton, 11 miles.

OWNER: PALADORA MINES LTD., 320, 475 Howe Street, Vancouver 1.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering the four Crown grants; line-cutting and flagging for electromagnetic survey, 7 line-miles.

CROWN (No. 30, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 45.5' Long. 116° 57.2' (82F/15W)
SLOCAN M.D. The property straddles a ridge between Cedar and Lendrum Creeks, about 2 miles west of Kootenay Lake. Workings are at an elevation of 4,500 feet.

CLAIMS: CROWN (Lot 12847) and ANCHOR recorded claim.

ACCESS: By 4 miles of road which leaves the Ainsworth-Kaslo Highway about 1 mile south of Woodbury Creek.

OWNER: D. H. NORCROSS, Granite Road, Nelson.

METALS: Silver, lead, zinc (production shown on Table I).

WORK DONE: In recent years, Mr. Norcross has developed small shoots of replacement ore situated in a logged area between Cedar and Lendrum Creeks. A small amount of sorted ore was mined from a cut on the west side of the Crown mineral claim, about 500 feet west of a similar showing developed by a short winze by Mr. Norcross in recent years. All production went to the Trail smelter.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 413.

BLUEBELL MINE (No. 176, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 45.7' Long. 116° 51.5' (82F/15W)
SLOCAN M.D. The mine is on Kootenay Lake, about 6 miles north of Kootenay Bay.

CLAIMS: BLUEBELL (Lot 50), KOOTENAY CHIEF (Lot 11), COMFORT (Lot 12), plus many other Crown-granted and recorded claims.

ACCESS: By 6 miles of paved road from the Kootenay Bay-Crawford Bay Highway.

(82F/15W)

OWNER: COMINCO LTD., Trail.
METALS: Silver, lead, zinc.
WORK DONE:

The mining operation at Bluebell was shut down in December 1971 after 23 years of continuous production.

Early in the year machinery, including electrical gear and pumps, was systematically withdrawn from the mine while providing adequate ventilation and protection of workmen from flooding. Lake water was later pumped into the workings to enable a study to be made of gas flows, etc., under stable flooded conditions. Many gas flows (carbon dioxide) were noted during the flooding but stopped upon completion of flooding.

Reclamation work was done during the summer of 1972 in accordance with the requirements of the *Mines Regulation Act*, and all dangerous openings were rendered safe from accidental entry.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 412.

KOOTENAY FLORENCE (WESTERN MILL) (No. 178, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 45.8' Long. 116° 55.1' (82F/15W)
SLOCAN M.D. The Western mill is on the Ainsworth-Kaslo Highway, about 1 mile south of Lendrum Creek.
OWNER: Western Mines Limited.
OPERATOR: TED SAVAGE, Nelson.
METALS: Lead, zinc (production shown on Table I).
WORK DONE: The Western mill operated in the early 1950's and has since been shut down. Until recently, the Kaslo-Nelson Highway ran under part of the mill but this highway was relocated several years ago and cut across the lower end of the mill. Since being closed, the mill building and machinery have deteriorated. Demolition of the mill was undertaken by Ted Savage during 1972. A clean-up of old concentrates was made and a small shipment of lead and zinc concentrate was sent to the Trail smelter.
REFERENCE: *Minister of Mines, B.C.*, Ann. Rept., 1960, p. 74.

NOR (No. 177, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 46' Long. 116° 57.5' (82F/15W)
SLOCAN M.D. The property is about 1 mile south of Lendrum Creek, and about 2 miles west of Kootenay Lake. The Crown (Lot 12847) lies about 3,000 feet southeast of the property.
CLAIM: NOR II.
ACCESS: By mining and logging roads from the Ainsworth-Kaslo Highway.
OWNER: W. E. LANE, Ainsworth.
METALS: Silver, lead, zinc.

(82F/15W)

WORK DONE:

A previously unexplored mineralized zone was found by the owner and subsequently exposed by a deep cut and some stripping. The showing is adjacent to an old logging road near the southeast corner of the claim at an elevation of 4,100 feet. The zone strikes about north 80 degrees west and dips steeply to the north. The mineralized portion of the zone varies in width but averages about 4 feet wide over a length of 30 feet.

A backhoe was used to excavate to unoxidized sulphides where a sample was taken across 5 feet which assayed: lead, 1.78 per cent; zinc, 5.70 per cent; silver, 25.4 ounces per ton.

GENERAL, GRANT (No. 187, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 47.5' Long. 116° 59.2' (82F/15W)
SLOCAN M.D. On the south side of Woodbury Creek at an elevation of 4,600 feet.

CLAIMS: GENERAL (Lot 9266), GRANT (Lot 9267).

ACCESS: By the Woodbury Creek mining road.

OWNER: Mrs. M. Willett, Cocoa Beach, Florida.

OPERATOR: G & S ENTERPRISES, Ainsworth.

METALS: Silver, lead, zinc, copper (production shown on Table I).

WORK DONE: The workings of the old mine were examined and found to contain insufficient ore to justify any further work. The mine was closed early in 1972. A small shipment of hand-sorted ore containing tetrahedrite was sent to the Trail smelter.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 413, 414.

ALICE (No. 36, Fig. A)

LOCATION: Lat. 49° 56.3' Long. 116° 47.1' (82F/15W)
SLOCAN M.D. At 4,000 feet elevation on the north slope of Kaslo Mountain, on the east side of Kootenay Lake.

CLAIMS: ALICE A, ALICE 1 and 2, 4 to 8, DODGER, DODGER 1 to 7.

ACCESS: From Kaslo by boat and then 2 miles by logging road or by aircraft from Kaslo.

OWNER: James Welden.

OPERATOR: CANEX PLACER LIMITED, 800, 1030 West Georgia Street, Vancouver 5.

METALS: Lead, zinc.

DESCRIPTION: Sulphide mineralization occurs in a limestone-dolomite remnant in the Fry Creek stock.

WORK DONE: Surface geological mapping, 1 inch equals 100 feet; geochemical soil survey, 215 samples.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1929, p. 325; 1930, p. 256 (Otto); Assessment Report 3803.

FERNIE 82G

ABC (No. 47, Fig. A)

LOCATION:	Lat. 49° 08.5′ Long. 114° 23′ (82G/1W) FORT STEELE M.D. At an elevation of 3,000 feet on Sage Creek, 6 miles east of the Flathead River.
CLAIMS:	ABC 1 to 4, 11 to 34.
ACCESS:	By road from Cranbrook, 70 miles.
OWNER:	MARK V PETROLEUMS & MINES LTD. (formerly Mark V Mines Limited), 301, 540 Burrard Street, Vancouver 1.
WORK DONE:	Geochemical soil survey, 75 samples.
REFERENCES:	*B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 415; Assessment Report 3931.

ROK, CAT (No. 13, Fig. A)

LOCATION:	Lat. 49° 13.5′ Long. 114° 41.5′ (82G/2E) FORT STEELE M.D. At approximately 7,300 feet elevation near headwaters of and between Howell and Twentynine Mile Creeks, 30 miles south of Fernie.
CLAIMS:	ROK, CAT, totalling approximately 40.
ACCESS:	By British Columbia Forest Service road from the Morrissey Bridge southwest of Fernie.
OWNER:	CONCEPT RESOURCES LTD. (formerly Canarctic Resources Ltd.), 300, 505 Fourth Avenue SW., Calgary, Alta.
METALS:	Copper, lead, zinc, fluorite.
DESCRIPTION:	The Howell Creek window is the main geological feature of the area. A complex alkali syenite-trachyte intrusion is exposed along the southwest margin of the window. A late Lower Cretaceous or early Upper Cretaceous age is suggested for the intrusion. Sedimentary formations in the immediate area vary in age from Precambrian Purcell to Upper Cretaceous Wapiabi and Belly River strata. The Lewis thrust and subsidiary thrust faults are the main structural features of the area.
WORK DONE:	Geological mapping; geochemical and electromagnetic surveys.
REFERENCES:	*B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 415; Assessment Report 3785.

TIE (No. 24, Fig. A)

LOCATION:	Lat. 49° 25′ Long. 115° 21′ (82G/6W) FORT STEELE M.D. Two miles northwest of Tie Lake, 2.5 miles east of Wardner.
CLAIMS:	TIE 1 to 8.
ACCESS:	By road from Wardner, 2.5 miles.
OWNER:	COMINCO LTD., Box 2000, Kimberley.
WORK DONE:	Geochemical soil survey covering Tie 3, 5, and 7.
REFERENCES:	*B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 416; Assessment Report 3678.

MAX (No. 110, Fig. A)

LOCATION: Lat. 49° 28′-30′ Long. 115° 18′-20.5′ (82G/6W)
FORT STEELE M.D. Between 3,000 and 5,500 feet elevaton near Murray Lake, 5 miles northeast of Wardner.
CLAIMS: MAX 9 to 42, 46 to 51.
ACCESS: By paved and gravel road from Wardner, 10 miles.
OWNER: PLACID OIL COMPANY, 860 Guinness House, Calgary 2, Alta.
WORK DONE: Electromagnetic survey, 12 line-miles covering Max 9-16, 19, 27, 29-35.

RIO (No. 48, Fig. A)

LOCATION: Lat. 49° 29.5′ Long. 115° 25′ (82G/6W)
FORT STEELE M.D. Approximately 7 miles northwest of Wardner.
CLAIMS: RIO 5 to 19, 207 to 224, 230 to 234 (Bull River Prospect).
ACCESS: By road from Wardner, 4 miles north then 3 miles east-northeast along the Placid Oil Company road.
OWNER: RIO ALTO EXPLORATION LTD., 920, 355 Fourth Avenue SW., Calgary, Alta.
WORK DONE: Seismic refraction survey covering Rio 6, 8, 10-19, 207, 209, 211, 213, 215-224.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 416; Assessment Report 3929.

COPPER KING (No. 18, Fig. A)

LOCATION: Lat. 49° 30.5′ Long. 115° 21.5′ (82G/6W, 11W)
FORT STEELE M.D. At 2,900 to 4,700 feet elevation on the west bank of Bull River, 34 miles east of Cranbrook.
CLAIMS: NEW MAX 1 to 8, NEW DAM 1 to 6, PROVIDENCE (Lot 6670).
ACCESS: By paved and gravel road from Wardner, 10 miles.
OWNER: PLACID OIL COMPANY, 860 Guinness House, Calgary, Alta.
METALS: Copper, lead.
DESCRIPTION: Chalcopyrite and galena occur in quartz-siderite veins in metadiorite dykes.
WORK DONE: Surface geological mapping, 1 inch equals 200 feet covering all claims; electromagnetic survey, 6 line-miles covering New Max 1-8, New Dam 2-4, and Providence; geochemical soil survey, 1,500 samples covering same claims as electromagnetic survey.
REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1925, p. 228; Assessment Report 3700.

DIBBLE (No. 109, Fig. A)

LOCATION: Lat. 49° 35′ Long. 115° 26′ (82G/11W)
FORT STEELE M.D. At 7,000 feet elevation on Hungary Peak, near the headwaters of Sunken Creek, 16 miles northeast of Cranbrook.

(82G/11W, 6W)

CLAIMS:	LAST CHANCE, LAST CHANCE EXTENSION, RICHMOND HILL, BEAVER FRACTION (Lots 3070 to 3073), FOSTER (Lot 3539), EMERALD (Lot 4402).
ACCESS:	By helicopter from Cranbrook, 20 miles.
OPERATORS:	T.V.I. MINING LTD. and ATHABASKA COLUMBIA MINING LTD., 2405, 505 Sixth Street SW., Calgary, Alta.
METALS:	Copper, silver, gold.
DESCRIPTION:	Mineralization occurs in quartz veins in argillaceous quartzites of the Precambrian Creston Formation.
WORK DONE:	Electromagnetic survey, 3 line-miles.
REFERENCES:	*B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 348; Assessment Report 4122.

BULL RIVER MINE (No. 157, Fig. A)

By R. W. Lewis

LOCATION:	Lat. 49° 30′ Long. 115° 23′ (82G/11W, 6W) FORT STEELE M.D. At 3,500 feet elevation on Burntbridge Creek north of the Bull River road, 5 miles due north of Wardner.
CLAIMS:	One hundred and five full and 12 fractional claims.
ACCESS:	Off Highway 3 at Wardner, north 5 miles along the Fort Steele road, then 3 miles west along the Bull River road.
OWNER:	PLACID OIL COMPANY, 860 Guinness House, Calgary, Alta.; mine address, Box 850, Cranbrook.
METALS:	Copper, silver, gold (production shown on Table I).
DESCRIPTION:	

This deposit is being worked by open-pit methods. The overburden is almost entirely stripped by bulldozers with a minimum amount of drilling and blasting. The overburden is hauled from the pit area by 35-ton trucks and spoiled at a terraced dump location. The uncovered ore is then drilled and blasted and hauled to a small stockpile adjacent to the crusher building.

Milling of the ore is simple; the crushing and grinding circuits have a capacity of 750 tons per day.

A total of 5,874 feet of BQ wireline diamond drilling was done during the months of April, May, June, and July by a drilling contractor. The drilling was done immediately below the tailings pond and plantsite area. A temporary two-trailer camp was established east of the plantsite and a 5-foot by 8-foot regrind ball mill was added to the concentrator.

Approximately 1,000 soil samples were taken (100,000 lineal feet) and analysed for copper, iron, nickel, and silver. Seven lineal miles of electromagnetic surveying was completed in and around the open-pit area.

All production work for the past year came from the No. 2 pit area where the ore bench was taken down to the 3,060 elevation by year end. It is anticipated that the No. 2 pit will be completed in the first half of 1973.

Preproduction stripping was done on the No. 1 pit area by a construction company during the past summer. A total of 278,550 broken cubic yards of overburden was removed from this area commencing on the 3260 bench. This pit has now been developed down to 3,140 elevation.

Quantities removed from the No. 2 pit consisted of 980,123 broken cubic yards of overburden, 308,746 tons of waste rock, and 190,596 tons of ore. The pit was operated 16 hours a day, 5 days a week.

Total tons milled for the year was 206,331 and a total of 8,762 tons of concentrate was produced. The mill was operated at 700 tons per day, 7 days a week, however during the winter months the mill operation was reduced to 5 days per week.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 417.

CORONADO (No. 111, Fig. A)

LOCATION: Lat. 49° 43′ Long. 115° 29′ (82G/11W)
FORT STEELE M.D. At approximately 6,700 feet elevation 3 miles east of Wild Horse River, 2 miles southwest of Mount Haley.

CLAIMS: CORONADO, ARENA, ARENA Fraction (Lots 3535 to 3537), COR 1 to 4, NEW COR 5 to 14, NEW COR 1 and 2 Fractions.

ACCESS: By logging roads from Fort Steele, 12 miles.

OPERATOR: PLACID OIL COMPANY, 860 Guinness House, Calgary 2, Alta.

METALS: Copper, silver.

DESCRIPTION: Tetrahedrite occurs as blebs and in discontinuous veinlets in dolomite.

WORK DONE: Road construction; surface diamond drilling, five holes totalling 2,662 feet.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1930, p. 241; *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 418.

JIM JIM (No. 50, Fig. A)

LOCATION: Lat. 49° 40.7′ Long. 115° 36′ (82G/12E)
FORT STEELE M.D. On the southern slopes of Lakit Mountain, 5 miles north of Fort Steele, 1.5 miles west of Wild Horse River.

CLAIMS: JIM JIM 1 and 2.

ACCESS: By secondary road from Fort Steele, 5 miles.

OPERATOR: DeKALB MINING CORPORATION, 635 Sixth Avenue SW., Calgary, Alta.

DESCRIPTION: The claims are underlain by rocks of the Lower Aldridge Formation.

WORK DONE: Geochemical survey.

REFERENCE: Assessment Report 3933.

PAT (No. 108, Fig. A)

LOCATION: Lat. 49° 39′-40.8′ Long. 115° 35.5′-39′ (82G/12E)
FORT STEELE M.D. At approximately 2,000 feet elevation between Lakit and Brewery Creeks, 3 miles north of Fort Steele.

(82G/12E, 11W)

CLAIMS: PAT 1 to 47.

ACCESS: By road from Fort Steele, 5 miles.

OPERATOR: McINTYRE PORCUPINE MINES LIMITED, 1003, 409 Granville Street, Vancouver 2.

WORK DONE: Magnetometer and electromagnetic survey, 25 line-miles; geochemical soil survey, 1,200 samples.

MIDAS, BIG CHIEF (No. 77, Fig. A)

LOCATION: Lat. 49° 40.8' Long. 115° 30.5' (82G/12E, 11W)
FORT STEELE M.D. On Boulder Creek, 1.5 miles east of the Wild Horse River, 6 miles northeast of Fort Steele.

CLAIMS: MIDAS (Lot 5456), BIG CHIEF (Lot (4046), GOLDEN COIN (Lot 4048), AMES (Lot 4047), MIDAS 2 to 9, PONDEROSA, PONDEROSA 2 to 6, 13 to 17, PENLOCK 1 to 8, BLUE OX, ALPINE 2 and 3.

ACCESS: By road from Fort Steele.

OPERATOR: MIST VALLEY RESOURCES LIMITED, 1002, 1655 Haro Street, Vancouver 5.

METALS: Silver, lead, zinc.

DESCRIPTION: Sulphide mineralization occurs in an altered and fractured syenite dyke.

WORK DONE: Line-cutting; trenching, 120 feet on Blue Ox and Ponderosa; stripping, 1,700 feet on Penlock 3, Alpine 3, Blue Ox, Golden Coin, Ponderosa 2, and Ames.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1968, p. 269; Assessment Report 3928 (line-cutting).

LILY MAY EXTENSION (No. 107, Fig. A)

LOCATION: Lat. 49° 42.5' Long. 115° 33' (82G/12E)
FORT STEELE M.D. At approximately 3,600 feet elevation on Wild Horse River, at its junction with Sunk Creek, 7 miles north-northeast of Fort Steele.

CLAIMS: PINTO 1 to 4.

ACCESS: By road from Fort Steele, 9 miles.

OPERATOR: PLACID OIL COMPANY, 860 Guinness House, Calgary 2, Alta.

METALS: Lead, copper.

DESCRIPTION: Galena and chalcopyrite mineralization occurs in quartz veins in the Aldridge Formation.

WORK DONE: Trenching, 3,000 feet on Pinto 2, 3, and 4.

REFERENCE: *Geol. Surv., Canada*, Mem. 207, p. 50.

HUNT (No. 127, Fig. A)

LOCATION: Lat. 49° 41'-42' Long. 115° 43.5'-48.5' (82G/12)
FORT STEELE M.D. On Mather Creek, 9 miles east of Kimberley.

CLAIMS: HUNT 1 to 48.

(82G/12W)

ACCESS: By paved road from Kimberley.
OWNER: C. W. Hunt.
OPERATORS: T.V.I. MINING LTD., 2405, 505 Sixth Street SW., Calgary, Alta. and C. W. HUNT, 1119 Sydenham Road, Calgary, Alta.
DESCRIPTION: The claims are underlain by argillites, siltstones, and quartzites of the Creston Formation.
WORK DONE: Induced polarization survey; geochemical soil survey.
REFERENCES: Assessment Reports 4123, 4268.

KIM (No. 106, Fig. A)

LOCATION: Lat. 49° 39′ Long. 115° 53′ (82G/12W)
FORT STEELE M.D. At approximately 3,300 feet elevation on Lone Pine Hill, 2 miles north of Wycliffe.
CLAIMS: KIM, totalling approximately 106.
ACCESS: By road from Kimberley, 6 miles.
OWNER: IMPERIAL OIL LIMITED, 500 Sixth Avenue SW., Calgary, Alta.
METALS: Lead, zinc.
WORK DONE: Surface geological mapping, 1 inch equals 500 feet; surface diamond drilling, two holes totalling 1,284 feet on Kim 51 and 157.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, Ann. Rept., 1970, p. 475.

KANANASKIS 82J

WESCO (No. 103, Fig. A)

LOCATION: Lat. 50° 30′ Long. 115° 56′ (82J/5W, 12W)
GOLDEN M.D. At approximately 4,150 feet elevation between Windermere and Burnais Creeks, 3.5 miles northeast of Windermere.
CLAIMS: WESCO 1 to 8, 15 to 18, JUNIPER 1 to 4, ROSE 1 and 2, RIO 1 to 4, 225 to 229, 230 to 235.
ACCESS: By road from Windermere, 3.5 miles.
OWNER: RIO ALTO EXPLORATION LTD., 920, 355 Fourth Avenue SW., Calgary, Alta.
METAL: Copper.
DESCRIPTION: Copper-bearing veins occur in brecciated Jubilee Formation dolomite.
WORK DONE: Geochemical soil survey, 206 samples.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 419.

LARDEAU 82K

DOC No. 51, Fig. A)

LOCATION: Lat. 50° 06.2′ Long. 116° 10′ (82K/1E)
GOLDEN M.D. Between Doctor and Findlay Creeks, 45 miles northwest of Cranbrook.
CLAIMS: DOC 1 to 6.
ACCESS: By helicopter from Cranbrook, 45 miles or by road and trail from Canal Flats, 15 miles.

(82K/2W)

OWNER: KERR ADDISON MINES LIMITED, 405, 1112 West Pender Street, Vancouver 1.

METAL: Lead.

DESCRIPTION: Scattered blebs of galena occur in quartz veins in argillites and argillaceous quartzites of the Aldridge Formation.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; geochemical soil survey, 45 samples.

REFERENCE: Assessment Report 3924.

FOG (No. 49, Fig. A)

LOCATION: Lat. 50° 14.5' Long. 116° 54.5' (82K/2W)
SLOCAN M.D. At elevations of 4,000 to 4,500 feet halfway between Duncan and Kootenay Lakes, 1.5 miles west of Mount Lavina, 27 miles north of Kaslo.

CLAIMS: FOG 1 to 21.

ACCESS: By road from Kaslo, 27 miles.

OPERATOR: MINERAL RESOURCES INTERNATIONAL LTD., One Calgary Place, 330 Fifth Avenue SW., Calgary, Alta.

METALS: Lead, zinc, silver, copper.

DESCRIPTION: A vein and replacement deposit occurs in limestone and dolomite.

WORK DONE: Electromagnetic survey.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 420; Assessment Report 3923.

WASHINGTON (No. 139, Fig. A)

By P. E. Olson

LOCATION: Lat. 50° 00.1' Long. 117° 13.1' (82K/3E)
SLOCAN M.D. Between elevations of 5,800 and 6,400 feet on the south side of McGuigan Creek.

CLAIMS: Fourteen claims, including the WASHINGTON (Lot 541) and SLOCAN BOY (Lot 626).

ACCESS: By the Antoine mine road which follows the north side of McGuigan Creek.

OWNER: Larch Mining Ltd.

OPERATOR: W. H. McLEOD, Silverton.

METALS: Silver, lead, zinc.

WORK DONE: Dump rock from the upper levels was crushed and run through a small jig to produce a concentrate chiefly of lead ore.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 423.

PAYNE (No. 181, Fig. A)

By P. E. Olson

LOCATION: Lat. 50° 00.4' Long. 117° 12.8' (82K/3E)
SLOCAN M.D. The mine is on Payne Ridge, between Carpenter and McGuigan Creeks, at an elevation of 5,000 feet.

CLAIMS: PAYNE (Lot 499) and several other Crown-granted claims.

(82K/3E)

ACCESS: By mining roads from Sandon.

OWNER: R. A. Grimes.

OPERATOR: TOBY CREEK MINES LTD., 204, 569 Howe Street, Vancouver 1.

METALS: Silver, lead, zinc.

WORK DONE: The mine was examined, using No. 5 level portal for entry, and access to No. 15 level was gained.

REFERENCE: *Minister of Mines, B.C.*, Ann. Rept., 1968, p. 252.

JK, NICO (No. 112, Fig. A)

LOCATION: Lat. 50° 00.5'-03' Long. 117° 00'-07' (82K/3E)
SLOCAN M.D. At elevations from 4,000 to 7,000 feet on Blue Ridge northeast of Kaslo River, from 3 to 6 miles east and east-southeast of Retallack between Rossiter and Emerald Creeks.

CLAIMS: JK, totalling 86 and NICO 1 to 5.

ACCESS: By logging road and helicopter from Retallack, 3 to 6 miles.

OWNER: Pan Ocean Oil Ltd.

OPERATOR: SPECTROAIR EXPLORATIONS LIMITED, 760, 890 West Pender Street, Vancouver 1.

METALS: Copper, nickel.

DESCRIPTION: Copper and nickel mineralization occurs in a serpentinized peridotite sill which intrudes volcanic rocks of the Kaslo Group.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; ground magnetometer survey and geochemical soil survey on JK claims.

REFERENCES: Assessment Reports 3925, 3930.

PHOENIX (No. 153, Fig. A)

LOCATION: Lat. 50° 03.6' Long. 117° 06.7' (82K/3E)
SLOCAN M.D. At 5,600 to 7,000 feet elevation 1.5 miles north-northeast of the confluence of Whitewater Creek with the Kaslo River, 12 miles east of New Denver.

CLAIMS: PHOENIX (Lot 3336), FLETCHER (Lot 5608), HAVONA (Lot 5610).

ACCESS: By Highway 31A from New Denver.

OWNER: PAN OCEAN OIL LTD., 355 Fourth Avenue SW., Calgary, Alta.

METAL: Gold.

DESCRIPTION: The claims are underlain by serpentinized peridotites and greenstones of the Kaslo Group.

WORK DONE: Geological mapping, 1 inch equals 400 feet.

REFERENCES: *Geol. Surv., Canada*, Mem. 184, p. 241; Assessment Report 4126.

TOM, EK (No. 76, Fig. A)

LOCATION: Lat. 50° 04.8' Long. 117° 08.8' (82K/3E)
SLOCAN M.D. At approximately 6,000 feet elevation on Whitewater Creek, 2 miles north of Retallack.

CLAIMS: TOM, EK, CHRIS, TAP, TIM, TIP, TAM, totalling 79.

(82K/3E)

ACCESS:	By helicopter or road from Retallack, 2.5 miles.
OWNER:	Hi-Ridge Resources Ltd.
OPERATOR:	SPECTROAIR EXPLORATIONS LIMITED, 760, 890 West Pender Street, Vancouver 1.
METALS:	Copper, asbestos.
DESCRIPTION:	Chrysotile asbestos and minor copper mineralization occur in fracture fillings of a peridotite sill which intrudes volcanic rocks of the Kaslo Group.
WORK DONE:	Surface geological mapping, 1 inch equals 200 feet and magnetometer survey covering Tom 1-6; surface diamond drilling, two holes totalling 470 feet.
REFERENCES:	*B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 421, Assessment Report 3926.

SB (No. 75, Fig. A)

LOCATION:	Lat. 50° 05' Long. 117° 10.1' (82K/3E) SLOCAN M.D. Between 6,500 and 8,500 feet elevation on Whitewater Mountain, 2 to 5 miles north-northwest of Retallack.
CLAIMS:	SB, DDS, ELAINE, PAM, RITA, BJ, BETTY JO, LOIS, totalling approximately 135.
ACCESS:	By helicopter from Retallack, 2 to 5 miles.
OWNER:	Pan Ocean Oil Ltd.
OPERATOR:	SPECTROAIR EXPLORATIONS LIMITED, 760, 890 West Pender Street, Vancouver 1.
METALS:	Nickel, copper.
DESCRIPTION:	Nickel and copper mineralization occurs in a serpentinized peridotite sill which intrudes volcanic rocks of the Kaslo Group.
WORK DONE:	Surface geological mapping, 1 inch equals 400 feet; surface diamond drilling, 11 holes totalling 1,993 feet on SB 78.
REFERENCES:	*B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 422; Assessment Report 3921.

MOLLY HUGHES (No. 113, Fig. A)

LOCATION:	Lat. 50° 00.5' Long. 117° 23' (82K/3W) SLOCAN M.D. At approximately 3,000 feet elevation on Slocan Lake at the mouth of Tryon Creek, 1 mile north of New Denver.
CLAIMS:	MOLLY HUGHES (Lot 2106), KINKORA, REAL IDEA, PINTO, and TRYON Crown-granted claims; PPH 1 and 2, PHP 1 to 4.
ACCESS:	By road from New Denver, 1 mile.
OWNER:	DYKE MINES LTD., 320, 475 Howe Street, Vancouver 1.
METALS:	Silver, gold, lead, zinc.
DESCRIPTION:	Minor gold, silver, lead, and zinc mineralization occurs in a vein system within porphyritic granite and granodiorite of the Nelson batholith.
WORK DONE:	Reconnaissance surface geological mapping covering Kinkora, Pinto,

and Real Idea; underground geological mapping, 1 inch equals 20 feet covering the Kinkora (200 level).

REFERENCE: *Geol. Surv., Canada*, Mem. 184, pp. 85-87.

MILLIE MACK (No. 73, Fig. A)

LOCATION: Lat. 50° 02.9′ Long. 117° 43.2′ (82K/4)
SLOCAN M.D. On the southwest slope of Silver Mountain, on the north side of Cariboo Creek, 7 miles northeast of Burton.

CLAIMS: MILLIE MACK (Lot 1831), BLACK BEAR (Lot 4194), RMW, RSM, totalling approximately 75.

ACCESS: By helicopter from Nelson, 45 miles.

OWNER: RICHWOOD INDUSTRIES LTD. (formerly Richwood Silver Mines Ltd.), 1220, One Bentall Centre, Vancouver 1.

METALS: Silver, lead, zinc, gold.

DESCRIPTION: Galena, tetrahedrite, sphalerite, and arsenopyrite occur in a broken quartz vein in graphitic slate.

WORK DONE: Magnetometer and geochemical surveys.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 423, 424; Assessment Report 3922.

SENORITA (MAGNET) (No. 180, Fig. A) By P. E. Olson

LOCATION: Lat. 50° 30′ Long. 117° 17′ (82K/6W, 11W)
SLOCAN M.D. The property is on Mobbs Creek, 2 miles by trail from Gerrard. The main showings are at an elevation of 2,700 feet.

CLAIMS: MAGNET, DD.

ACCESS: By trail which follows the north side of Mobbs Creek, mainly along canyon walls.

OWNER: Compet Resources Limited.

OPERATOR: DANIEL MELNYCK, Meadow Creek.

METALS: Silver, lead, zinc.

WORK DONE: A road was partially constructed from logging roads on the mountain ridge between Tenderfoot and Mobbs Creek. This work was not completed.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1933, p. 273; *Geol. Surv., Canada*, Mem. 161, p. 52.

LAVINA (No. 182, Fig. A) By P. E. Olson

LOCATION: Lat. 50° 15.0′ Long. 116° 53.5′ (82K/7W)
SLOCAN M.D. The property lies on the peak of Lavina Mountain with workings on either side of the ridge.

CLAIMS: LAVINA (Lot 3785) and adjoining Crown grants.

ACCESS: By steep mining roads from the Duncan Reservoir.

OWNER: ARCHIE GRAHAM, Kaslo.

(82K/7E)

METALS: Silver, lead, zinc (production shown on Table I).

WORK DONE: A steep road was extended to the mine and several tons of ore was sorted from dumps. A small shipment was made to the Trail smelter.

REFERENCE: *Minister of Mines, B.C.*, Ann. Rept., 1927, p. 283.

SEC (No. 97, Fig. A)

LOCATION: Lat. 50° 25.7′-28.4′ Long. 116° 32′-35.5′ (82K/7E)
GOLDEN M.D. At approximately 9,000 feet elevation between Farnham and Horsethief Creeks, immediately east of Lake of the Hanging Glacier, 25 miles southwest of Invermere.

CLAIMS: SEC 1 to 71.

ACCESS: By road from Radium Hot Springs, about 25 miles.

OWNER: UNION CARBIDE EXPLORATION CORPORATION, 601, 1112 West Pender Street, Vancouver 1.

METAL: Tungsten.

DESCRIPTION: Scheelite occurs in skarn.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; geochemical survey, 6 line-miles covering Sec 18, 20, and 55.

RAD (No. 104, Fig. A)

LOCATION: Lat. 50° 25′ Long. 116° 24′ (82K/8W)
GOLDEN M.D. At approximately 7,000 feet elevation along the south side of Delphine Creek, 23 miles southwest of Invermere.

CLAIMS: RAD 1, 3 to 5, 16, 17, 28, 40, 41.

ACCESS: By road from Invermere, 23 miles.

OPERATOR: MEDESTO EXPLORATION LTD., 215A – 10th Street NW., Calgary, Alta.

METALS: Silver, lead.

DESCRIPTION: Lead and silver mineralization occurs in grey, green, and black argillite and slate, dolomite, and argillaceous quartzite of the Dutch Creek and Mount Nelson Formations.

WORK DONE: Trenching, 200 square feet on Rad 17 and 28.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 425.

BLUEBIRD (No. 79, Fig. A)

LOCATION: Lat. 50° 33.5′ Long. 116° 20.5′ (82K/9W)
GOLDEN M.D. At 4,000 to 4,500 feet elevation between Gopher and Haultain Creeks, south of Horsethief Creek, 28 miles west-northwest of Invermere.

ACCESS: By road from Invermere, 28 miles.

CLAIMS: BLUEBIRD 1 to 24.

OWNERS: J. H. CONROY and A. LOUIE, Box 325, Invermere.

METALS: Lead, zinc, copper, silver.

(82K/9W)

DESCRIPTION: Lead, zinc, copper, and silver mineralization occurs in fractures and veins within dolomite of the Jubilee Formation.

WORK DONE: Geochemical soil survey, 150 samples covering parts of Bluebird 5-8; road construction 1 mile (from main Horsethief road); trenching, 100 feet on Bluebird 1-8.

GROTTO (No. 156, Fig. A)

LOCATION: Lat. 50° 34′-35.5′ Long. 116° 20′-22′ (82K/9W)
GOLDEN M.D. At approximately 3,600 feet elevation on Horsethief Creek between Gopher and Haultain Creeks, 15 miles northeast of Invermere.

CLAIMS: GROTTO, totalling 29.

ACCESS: By road from Invermere, 20 miles.

OWNER: GROTTO SILVER MINES LTD., Box 94, Invermere.

METALS: Silver, lead, zinc.

WORK DONE: Geochemical soil survey, 200 samples; some trenching and stripping; surface diamond drilling, one hole totalling 280 feet.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1927, p. 264; *Geol. Surv., Canada,* Mem. 148, p. 50.

ANNETTE, SLIDE (No. 17, Fig. A)

LOCATION: Lat. 50° 38.5′ Long. 116° 30.0′ (82K/9W, 10E)
GOLDEN M.D. Between 4,800 and 9,000 feet elevation along the Horsethief-Stockdale Creek valley, 22 miles west of Radium Hot Springs.

CLAIMS: ANNETTE, SLIDE, ALDER, TALUS, ZEN, BEV, CC, BLUE, DOT, ICE, totalling 119.

ACCESS: By logging road from Radium Hot Springs, 22 miles.

OWNER: CANADIAN JOHNS-MANVILLE COMPANY LIMITED, Box 1500, Asbestos, P.Q.

METALS: Molybdenum, uranium, tungsten.

DESCRIPTION: Mineralization occurs in coarse-grained quartz monzonite and granite of the Horsethief stock.

WORK DONE: Geological mapping, induced polarization surveying covering 5.5 line-miles, biogeochemical sampling, and diamond drilling on the Alder and Talus claims during 1971. Surface geological mapping, 1 inch equals 200 feet and 1 inch equals 1,000 feet and geochemical soil survey, 240 samples covering Bev claims during 1972.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 426; Assessment Reports 3581, 3754, 3755, 3805, 3806, 4240.

TAMARAK (No. 78, Fig. A)

LOCATION: Lat. 50° 32′ Long. 116° 31′ (82K/10E)
GOLDEN M.D. Between 4,500 and 5,500 feet elevation at the junction of Paulding and Horsethief Creeks, 27 miles west of Invermere.

(82K/10E)

CLAIMS: TAMARAK 1 to 23, J RANK 1 and 2.

ACCESS: By road from Invermere, 27 miles.

OWNER: J. H. CONROY and A. LOUIE, Box 325, Invermere.

METALS: Lead, zinc, silver, iron.

DESCRIPTION: Lead, zinc, silver, and iron mineralization occurs within dolomite of the Dutch Creek Formation.

WORK DONE: Geochemical soil survey, 50 samples covering parts of Tamarak 1, 2, and 18; 1.5 miles of road cleared; trenching, 50 feet on Tamarak 1; stripping, 4,250 square feet on Tamarak 1 and 18.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 427.

BEE (No. 99, Fig. A)

LOCATION: Lat. 50° 40' Long. 116° 36' (82K/10E)
GOLDEN and SLOCAN M.D. At approximately 8,000 feet elevation north of Whirlpool Lake at the head of Forster Creek, 25 miles northwest of Invermere.

CLAIMS: BEE 1 to 16.

ACCESS: By helicopter from Radium Hot Springs, 25 miles.

OWNER: UNION CARBIDE EXPLORATION CORPORATION, 601, 1112 West Pender Street, Vancouver 1.

METAL: Tungsten.

DESCRIPTION: Scheelite occurs in skarn.

WORK DONE: Surface geological mapping, 1 inch equals 50 feet covering Bee 3 and 10.

SILVER BASIN (No. 100, Fig. A)

LOCATION: Lat. 50° 41.2' Long. 116° 44.7' (82K/10E)
GOLDEN and SLOCAN M.D. At approximately 7,200 feet elevation at the headwaters of Bugaboo Creek.

CLAIMS: WESTERN CROSS (Lot 1978), NO. 21 (Lot 1977), SILVER 1 to 22.

ACCESS: By road from Brisco, 30 miles.

OWNER: PURCELL DEVELOPMENT CO. LTD., Brisco.

METALS: Silver, lead, zinc.

DESCRIPTION: Rocks exposed on the claims and penetrated by the diamond-drill holes comprise metamorphosed argillite and calcareous argillite of the Horsethief stock.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 428.

LEAD QUEEN (No. 105, Fig. A)

LOCATION: Lat. 50° 43' Long. 116° 34.4' (82K/10E)
GOLDEN M.D. Between 5,500 to 7,000 feet elevation 1.5 miles north of the junction of McLean and Frances Creeks, approximately 22 miles northwest of Radium Hot Springs.

CLAIMS: LEAD QUEEN (Lot 12763) plus other Crown grants (Lots 11422, 11424-11426, 11428, 12754, 12765, 12766), FUN 1 to 8, CHAN 1 to

16, WS 1 to 16, FM 1 to 14, KLICK 1 and 2, CREEK 1 to 4, SB 1 to 3, GORD 1 to 6, ME 1 to 4.

ACCESS: By road from Radium, 34 miles.

OWNER: FRANCES CREEK MINES LTD., 205, 709 Eighth Avenue SW., Calgary, Alta.

METALS: Silver, lead, zinc.

DESCRIPTION: A faulted fissure vein system occurs in metamorphosed carbonate rocks of the Mount Nelson Formation in the upper part of the Purcell Group.

WORK DONE: Topography and surface and underground workings mapped; magnetometer survey (not completed, snowed out); road construction, one-half mile.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 427.

INTERNATIONAL (RIVERSIDE) (No. 179, Fig. A)

By P. E. Olson

LOCATION: Lat. 50° 32.1′ Long. 116° 56.1′ (82K/10W)
SLOCAN M.D. The property is on Pat Creek, on the east side of the Duncan River valley at an elevation of 5,200 feet.

CLAIMS: JIANT, HOWSER, CHISHOLM, SOUTHERN, POOLE, BRENNAN, PORTLAND, FORGOTTEN, CABIN Fraction (Lots 14358 to 14363, 14940 to 14942); KASLO 1 to 6.

ACCESS: By logging road along the east side of the Duncan River valley and thence by steep mining road to the property.

OWNER: KASLO MINES LIMITED, Kaslo.

METALS: Silver, lead.

DESCRIPTION: A bedded quartz vein carrying disseminated galena was prospected by drifts, cuts, and short shafts during the 1920's. The Riverside adits are located on the southern part of the Forgotten claim (Lot 14941) and northern part of the Jiant claim (Lot 14358).

WORK DONE: A road was constructed from the Duncan River valley access road to the showings. This road starts near the mouth of Pat Creek and follows a broad wooded ridge via switchbacks to the principal showings. Some prospecting and reopening of old workings were done before the onset of winter.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1918, p. 162; 1929, p. 325; *Geol. Surv., Canada*, Mem. 161, p. 51.

WINSLOW (No. 159, Fig. A)

LOCATION: Lat. 50° 37.2′ Long. 117° 23′ (82K/11W)
REVELSTOKE M.D. At approximately 7,200 feet elevation at the head of Burg Creek, 7 miles southeast of the settlement of Trout Lake, about 30 air-miles southeast of Revelstoke.

CLAIMS: WINDSLOW, totalling 14.

ACCESS: By aircraft from Revelstoke, 30 miles.

OWNER: MILESTONE MINES LIMITED, 574 One Calgary Place, Calgary, Alta.

(82K/11W)

METALS: Gold, silver, lead, zinc.

DESCRIPTION: Lead, zinc, gold, and silver mineralization occurs in veins within phyllitic grey grits near the base of the middle Broadview Formation (Lardeau Group).

WORK DONE: Trenching, 40 feet on Windslow 9-12.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1939, p. 78; *B.C. Dept. of Mines & Pet. Res.,* Bull. 45, p. 85; *Geol. Surv., Canada,* Mem. 161, p. 65.

SILVER CUP (No. 170, Fig. A)

By P. E. Olson

LOCATION: Lat. 50° 38′ Long. 117° 22′ (82K/11W)
REVELSTOKE M.D. The property is near the head of Cup Creek, a tributary of Lardeau Creek from the south.

CLAIMS: SILVER CUP (Lot 768), TOWSER (Lot 1565), and other adjoining Crown-granted and recorded claims.

ACCESS: By mining road from Ferguson, 5 miles.

OPERATOR: PANDORA MANAGEMENT LTD., Ferguson.

METALS: Silver, lead, zinc.

WORK DONE: The mining road from Ferguson to the property was widened and new bridges were built across Ferguson and Lardeau Creeks. A pipeline was laid from the property to the vicinity of Lardeau Creek to transport crushed dump rock for eventual gravity concentration. This system was not tried due to the onset of very cold weather.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 429.

TRUE FISSURE (No. 102, Fig. A)

By P. E. Olson

LOCATION: Lat. 50° 42.5′ Long. 117° 30′ (82K/11W, 12E)
REVELSTOKE M.D. The property is on Great Northern Mountain, about 2 miles north of Ferguson.

CLAIMS: TRUE FISSURE (Lot 1097), BLUE BELL (Lot 5707), GREAT NORTHERN (Lot 1099), BROADVIEW (Lot 1550), ST. ELMO (Lot 4581) plus 22 adjoining Crown grants.

ACCESS: By 3 miles of improved mining road from Ferguson.

OWNER: COLUMBIA METALS CORPORATION, LIMITED, 34 Adelaide Street West, Toronto, Ont.

METALS: Silver, lead, zinc, copper.

DESCRIPTION: Galena, sphalerite, pyrite, chalcopyrite, and tetrahedrite occur in quartz and skarn veins in grit and phyllite of the Broadview Formation.

WORK DONE: Electromagnetic and self-potential surveys covering St. Elmo, Blue Bell, True Fissure, and Great Northern; surface diamond drilling, 54 holes totalling 3,618 feet on St. Elmo, Blue Bell, True Fissure, Great Northern, and Broadview.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 429; *Geol. Surv., Canada,* Mem. 161, p. 70.

VMS (No. 38, Fig. A)

LOCATION: Lat. 50° 34' Long. 117° 35.5' (82K/12E)
REVELSTOKE M.D. Between elevations of 4,000 to 8,000 feet on Asher Creek, 4 miles southwest of Trout Lake, 40 miles southeast of Revelstoke.
CLAIMS: VMS 1 to 26.
ACCESS: By helicopter from Trout Lake village, 6 miles.
OWNER: PAN OCEAN OIL LTD., 1050, 355 Fourth Avenue SW., Calgary, Alta.
METALS: Silver, lead, zinc, copper, molybdenum.
DESCRIPTION: The property is underlain by a sequence of metamorphosed rocks which includes graphitic slates and argillite, quartzite, and quartz feldspar biotite schist and gneiss of higher metamorphic grade. Several bands of limestone are present, some of which are altered to skarn; they are intruded by a granodiorite pluton and by many small sills and dykes. Minor lead, zinc, copper, and molybdenum mineralization occurs in skarn and in quartz veins.
WORK DONE: Surface geological mapping, 1 inch equals 500 feet and geochemical soil survey, 258 samples covering all claims.
REFERENCE: Assessment Report 3804.

VICTOR (No. 184, Fig. A)

LOCATION: Lat. 50° 00.0' Long. 117° 16.1' (82F/14W; 82K/13W)
Report on this property in section 82F/14W.

ADR (No. 101, Fig. A)

LOCATION: Lat. 50° 55' Long. 116° 58' (82K/15W)
GOLDEN M.D. At approximately 6,500 feet elevation near the head of Vowell and Crystalline Creeks, south of Golden.
CLAIMS: RJF 1 to 11.
ACCESS: By road from Parson, 35 miles.
OPERATOR: MEDESTO EXPLORATION LTD., 215A Tenth Street NW., Calgary, Alta.
METALS: Silver, lead.
DESCRIPTION: Two quartz veins, within metamorphosed rocks of the Horsethief stock, contain argentiferous galena and chalcopyrite.
WORK DONE: Trenching, 250 square feet on RJF 3 and 7.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 429 (ADR).

BOB, HL (No. 98, Fig. A)

LOCATION: Lat. 50° 53.4' Long. 116° 43.5' (82K/15E)
GOLDEN M.D. At approximately 4,500 feet elevation on Warren Creek, 5 miles south of its junction with Bobbie Burns Creek.
CLAIMS: BOB 1 to 4, HL 6 to 8, 20 to 25, LIZ 166 and 167.

(82L/1W)

ACCESS: By logging road from Parson, 24 miles.
OWNER: JUNIPER MINES LTD., 107, 325 Howe Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Chalcopyrite occurs in silicified gouge of a fault zone contained within the Horsethief stock.
WORK DONE: Surface geological mapping, 1 inch equals 400 feet; magnetometer survey, 4.55 line-miles and self-potential survey, 4.55 miles covering HL 1 and 2 and Liz 166 and 167; geochemical soil survey, 398 samples covering 1 and 2 and Liz 166 and 167; 8 miles of four-wheel-drive vehicle road repaired.
REFERENCE: *Minister of Mines, B.C.*, Ann. Rept., 1968, 265.

VERNON 82L

ST. PAUL (No. 140, Fig. A)

LOCATION: Lat. 50° 08.7' Long. 118° 27.2' (82L/1W)
VERNON M.D. At approximately 5,600 feet elevation on the north slope of Monashee Mountain, about 35 air-miles east of Vernon.
CLAIMS: BLACK BESS (Lot 4186), MINERVA (Lot 4187), TOUGHNUT (Lot 4189), ZILPAH (Lot 4188), SKB, SNOWSHOE, SNOW.
ACCESS: By road from Highway 6, 6 miles.
OPERATOR: W. MILLER, R.R. 2, Kidston Road, Vernon.
METALS: Silver, gold, antimony, lead.
DESCRIPTION: Lead, silver, gold, and antimony occur within veins contained in volcanic and sedimentary rocks.
WORK DONE: Trenching, 80,000 cubic feet and stripping, 10,000 square feet on Minerva and Toughnut.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 431.

AT (No. 151, Fig. A)

LOCATION: Lat. 50° 07.3' Long. 119° 42.5' (82L/4E)
VERNON M.D. North of Dun Water Creek, 22 miles northwest of Kelowna.
CLAIMS: DUN 1 to 8.
ACCESS: By Highway 97 and logging roads.
OWNER: CANADIAN JOHNS-MANVILLE COMPANY LIMITED, Box 1500, Asbestos, P.Q.
METALS: Molybdenum, copper.
DESCRIPTION: Minor molybdenite and chalcopyrite occur along fractures in altered granodiorite of the northern Okanagan batholith.
WORK DONE: Geochemical soil survey, 202 samples.
REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1967, p. 222; Assessment Report 4133.

JIM (No. 93, Fig. A)

LOCATION: Lat. 50° 24.3′ Long. 119° 47.5′ (82L/5W)
KAMLOOPS M.D. At approximately 3,500 feet elevation on Adelphi Creek, 1 miles east of the Salmon River, 5 miles south of Westwold.
CLAIMS: JIM 1 to 12, 28 to 35.
ACCESS: By road from Vernon, 38 miles.
OWNER: CUTLASS EXPLORATION LTD., 315, 543 Granville Street, Vancouver 2.
METAL: Molybdenum.
DESCRIPTION: A syenite plug contains molybdenite in fractures.
WORK DONE: Trenching.
REFERENCE: *Minister of Mines, B.C.*, Ann. Rept., 1965, p. 164.

DCK (No. 117, Fig. A)

LOCATION: Lat. 50° 17′ Long. 119° 09′ (82L/6E)
VERNON M.D. Between 3,500 and 4,000 feet elevation on the north slope of Vernon Hill, 4 miles east of Vernon.
CLAIMS: DCK, ANNE, WCR, DAKOTA, GOLD, SILVER STREAK, COPPER, DENYSE, X, totalling approximately 116.
ACCESS: By road from Vernon, 4 miles.
OWNER: KING GRAYBARR MINES LTD., Box 904, Vernon.
METALS: Lead, zinc, silver, gold, copper, molybdenum, nickel, cobalt, cadmium.
DESCRIPTION: Copper, lead, zinc, gold, and silver mineralization occurs as disseminations in quartz veins and fractures within gneissic rocks of the Shuswap Complex.
WORK DONE: Claims (partially), topography, and surface workings mapped; trenching, approximately 6,000 feet; stripping, approximately 2,000 feet.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 432, 433.

SH, AS (No. 96, Fig. A)

LOCATION: Lat. 50° 17.8′ Long. 118° 49′ (82L/7W)
VERNON M.D. At approximately 2,500 feet elevation northeast of Shuswap Falls, 8 miles northeast of Lumby.
CLAIMS: SH 1 to 15, AS 1 to 20.
ACCESS: By road from Lumby, approximately 10 miles.
OWNER: STANHOLM SILVER MINES LTD., 1545 Harvey Avenue, Kelowna.
METAL: Uranium.
DESCRIPTION: Uraninite is associated with pegmatite within the Monashee Group.
WORK DONE: Trenching, 300 feet and stripping 625 feet on AS 5, 7, and 9.

BETSY (No. 134, Fig. A)

LOCATION: Lat. 50° 40.5′ Long. 118° 45′ (82L/10)
VERNON M.D. On Kingfisher Creek, 4 miles north of the confluence of Shuswap River and Mabel Lake.

(82L/12E)

CLAIMS: BETSY 1 to 10.
ACCESS: From the Mabel Lake road, 6 miles.
OWNER: S & K MINING AND EXPLORATION LIMITED, 340 Wood Road, Rutland.
WORK DONE: Trenching, 80 feet; surface diamond drilling, three holes totalling 130 feet on Betsy 4, 6, and 8.

BUDGET (No. 92, Fig. A)

LOCATION: Lat. 50° 33.8′ Long. 119° 35.5′ (82L/12E)
KAMLOOPS and VERNON M.D. At approximately 5,000 feet elevation 1 mile southeast of Joyce Lake, 5 miles north of Falkland.
CLAIMS: BUDGET 1 to 32.
ACCESS: By logging road from Falkland, 9 miles.
OWNER: CANADIAN JOHNS-MANVILLE COMPANY LIMITED, Box 1500, Asbestos, P.Q.
METAL: Copper.
DESCRIPTION: A gossan zone is associated with Cache Creek argillites, quartzites, and limestones which are intruded by small granitic stocks.
WORK DONE: Geochemical survey, 800 samples.
REFERENCE: Assessment Report 4045.

CB (No. 120, Fig. A)

LOCATION: Lat. 50° 43′ Long. 119° 48.5′ (82L/12W)
KAMLOOPS M.D. Between 1,300 and 3,500 feet elevation on the north side of the South Thompson River, approximately 3 miles northeast of Pritchard.
CLAIMS: CB 1 and 2, AL 5 and 6, 13 to 18, 21 to 30, 33 and 34, K 1 to 4.
ACCESS: By the Pinantan Lake road from Pritchard, 3 miles.
OWNER: KAMAD SILVER CO. LTD., 301, 141 Victoria Street, Kamloops.
METAL: Copper.
DESCRIPTION: Pyrite, chalcopyrite, and malachite occur in andesite lava interbedded with tuff.
WORK DONE: Surface diamond drilling, two holes totalling 400 feet on CB 1 and 2.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 434.

EAST (No. 6, Fig. A)

LOCATION: Lat. 50° 57′-59.5′ Long. 119° 27.5′-36′ (82L/13E, 14W)
KAMLOOPS M.D. Between 1,700 and 4,500 feet elevation east of the south end of Adams Lake, extending from Nikwikwaia Creek to Scotch Creek, 7 miles north-northeast of Squilax.
CLAIMS: EAST, WEST, SOUTH, NIK, CORN, ACID, totalling 159.
ACCESS: By various logging roads leading to the property from the Squilax-Anglemont Highway, 8 miles.

(82L/13W)

OWNER: Derry Michener & Booth.

OPERATOR: SHUSWAP SYNDICATE, Box 795, Vernon.

METAL: Copper.

DESCRIPTION: Mineralization consists of disseminated sulphides in sericite phyllite, chlorite-sericite phyllite, chlorite phyllite, and quartzite. The sulphide minerals pyrrhotite, pyrite, and chalcopyrite also occur on foliation planes, in fractures, and in quartz veinlets.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 800 feet; ground magnetometer survey, 21 line-miles; geochemical survey, approximately 1,100 samples; road construction, one-quarter mile (access to drill sites); surface diamond drilling, five holes totalling 2,043 feet on East 21, 54, 55 and Acid 6 (work done during 1971).

REFERENCE: Assessment Report 3511.

HYAS, RHO (No. 31, Fig. A)

LOCATION: Lat. 50° 45'-49' Long. 119° 53' - 120° 00.5' (82L/13W; 92I/16E)

KAMLOOPS M.D. At approximately 4,000 feet elevation surrounding Hyas, Pemberton, and Rhoda Lakes, 20 miles northeast of Kamloops.

CLAIMS: HYAS 1 to 37, 41 to 46, RHO 1 to 40.

ACCESS: By Highway 5 and the Heffley Creek road.

OWNER: SPIRIT EXPLORATIONS LTD., 616, 850 West Hastings Street, Vancouver 1.

DESCRIPTION: The property is underlain by Cache Creek Group argillites and quartzites.

WORK DONE: Airborne magnetometer and electromagnetic surveys, 115 line-miles covering all claims.

REFERENCE: Assessment Report 3702.

JEN, COPPER NUGGET (No. 94, Fig. A)

LOCATION: Lat. 50° 53.0' Long. 119° 20.0' (82L/14W)

KAMLOOPS M.D. At elevations of 1,560 to 2,670 feet between Blind Bay and White Lake, 15 miles north of Salmon Arm.

CLAIMS: JEN 1 and 2, COPPER NUGGET 1 to 4, RIO 236 to 247.

ACCESS: By trail from Highway 1, 2.5 miles.

OWNER: RIO ALTO EXPLORATION LTD., 920, 355 Fourth Avenue SW., Calgary, Alta.

METALS: Copper, gold.

DESCRIPTION: The area is underlain by chlorite schists belonging to the Sicamous Formation. Mineralization consists of chalcopyrite and gold associated with the more siliceous strata and in quartz veins cutting them.

WORK DONE: Induced polarization survey, 9,800 feet covering Jen 1 and 2 and Copper Nugget 1-4; geochemical soil survey, 161 samples covering Rio 236 to 247.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 434, 435.

SWORD (No. 90, Fig. A)

LOCATION: Lat. 50° 51.5′ Long. 119° 10′ (82L/14E)
KAMLOOPS M.D. At approximately 5,000 feet elevation east of Reienacker Creek, 12 miles northeast of Salmon Arm.
CLAIMS: SWORD 1 to 16.
ACCESS: By logging road from White Lake, 9 miles.
OWNER: Derry Michener & Booth.
OPERATOR: SHUSWAP SYNDICATE, Box 795, Vernon.
DESCRIPTION: Trace amounts of chalcopyrite occur in chlorite and sericite phyllite.
WORK DONE: Surface geological mapping, 1 inch equals 400 feet and geochemical survey, 263 samples covering all claims.

SCIMITAR (No. 89, Fig. A)

LOCATION: Lat. 50° 52′ Long. 119° 08′ (82L/14E)
KAMLOOPS M.D. At 5,000 feet elevation north of Bastion Creek, 6 miles west-northwest of Sicamous.
CLAIMS: SCIMITAR 1 to 6.
ACCESS: By logging road from Eagle Bay, 10 miles.
OPERATOR: DERRY MICHENER & BOOTH, Box 795, Vernon.
DESCRIPTION: Trace amounts of chalcopyrite occur in chlorite and sericite phyllite.
WORK DONE: Geochemical survey, 106 samples covering all claims.

SABRE (No. 83, Fig. A)

LOCATION: Lat. 50° 52′ Long. 119° 13.5′ (82L/14E)
KAMLOOPS M.. Between 2,400 and 2,600 feet elevation immediately south of the east end of White Lake, 12 miles north of Salmon Arm.
CLAIMS: SABRE 1 to 18.
ACCESS: By logging road from Salmon Arm, 15 miles.
OWNER: Derry Michener & Booth.
OPERATOR: SHUSWAP SYNDICATE, Box 795, Vernon.
METALS: Copper, molybdenum.
DESCRIPTION: Pyrite, chalcopyrite, and molybdenite occur as disseminations on foliation planes and in fractures in chlorite phyllite, quartz-chlorite phyllite, and sericite phyllite.
WORK DONE: Surface geological mapping, 1 inch equals 400 feet and geochemical survey, 130 samples covering all claims; road construction, one-half mile; trenching, 200 feet on Sabre 8; stripping 8,000 square feet on Sabre 2; percussion drilling, two holes totalling 500 feet on Sabre 2 and 3.

DAWN, LAKEVIEW (No. 16, Fig. A)

LOCATION: Lat. 50° 46.8′ Long. 119° 04.2′ (82L/14E)
KAMLOOPS M.D. Five miles southwest of Sicamous, south of Highway 1.

(82L/15W)

CLAIMS: LAKEVIEW 1 to 4, LAKEVIEW 101 and 102 Fractions; DAWN 10 and 12.

ACCESS: By Highway 1 from Sicamous, 5 miles.

OWNER: ENID SPANKES, Monte Lake.

WORK DONE: Line-cutting.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 319; Assessment Report 3752.

QUEEST (No. 81, Fig. A)

LOCATION: Lat. 50° 59' Long. 118° 50' (82L/15W)
REVELSTOKE M.D. Between 6,000 and 7,000 feet elevation on Queest Mountain, 5 miles north-northeast of Sicamous.

CLAIMS: QUEEST, totalling 22.

ACCESS: By forestry road from Malakwa on Highway 1, 10 miles.

OWNER: Derry Michener & Booth.

OPERATOR: SHUSWAP SYNDICATE, Box 795, Vernon.

METALS: Copper, silver.

DESCRIPTION: Copper-silver mineralization occurs in breccia, quartz veins, fractures, and as disseminations on foliation planes. The host rocks include quartz-muscovite schist, skarn, massive pyrrhotite lenses, quartzite, and gneiss.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; ground magnetometer survey, 13 line-miles; geochemical soil survey, 450 samples; surface diamond drilling, three holes totalling 700 feet on Queest 1 and 2.

SEYMOUR ARM 82M

MOUNT COPELAND MINE (No. 149, Fig. A)

By E. Sadar

LOCATION: Lat. 51° 08' Long. 118° 29' (82M/1W)
REVELSTOKE M.D. On the south slope of Mount Copeland, 15 miles northwest of Revelstoke.

CLAIMS: Three hundred and eighty-two claims including the HAP, KEN, KNOW, XY and other groups.

ACCESS: By 20 miles of gravel road north from the Trans-Canada Highway 2 miles west of Revelstoke.

OWNER: King Resources Company.

OPERATOR: KRC OPERATORS LTD., Revelstoke.

METAL: Molybdenum (production shown on Table I).

DESCRIPTION: Molybdenite occurs in a southerly dipping zone of pegmatite and aplite veins contained within syenite gneiss country rock. The zone has been severely folded.

WORK DONE: Trackless haulage is employed in the ore zone. Main haulage is by conventional rail haulage for 6,000 feet to the surface bins from where

(82M/3)

the ore is trucked to the concentrator. Mining is by blasthole, shrinkage, and open slusher stoping methods. Exploration and development work: drifting and crosscutting, 1,555 feet; diamond drilling, 3,896 feet; stope development, 1,470 feet.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, pp. 464, 465; 1971, p. 435.

FLUKE (No. 40, Fig. A)

LOCATION: Lat. 51° 03.6′ Long. 119° 15′ (82M/3)
KAMLOOPS M.D. At approximately 5,600 feet elevation on Crowfoot Mountain, 10 miles north of Magna Bay.

CLAIMS: FLUKE 1 to 18.

ACCESS: By logging road from Magna Bay, 10 miles.

OPERATORS: T.V.I. MINING LTD. and ATHABASCA COLUMBIA MINING LTD., 2405, 505 Sixth Street SW., Calgary, Alta.

METALS: Copper, lead, zinc, silver.

DESCRIPTION: Zinc, lead, copper, and silver mineralization occurs as replacements in metacarbonates and in quartz veins.

WORK DONE: Topography and surface workings mapped; electromagnetic survey, 3.7 line-miles covering Fluke 3, 7-9, 11, 13, and 14; induced polarization survey, 1 line-mile covering Fluke 3-9, 11, 13, and 14; magnetometer survey, 26 line-miles covering all claims; geochemical soil survey, 366 samples covering all claims.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1932, p. 145 (Evelyn-Venus); *B.C. Dept. of Mines & Pet. Res.*, Ann. Rept., 1964, p. 99 (Bet, Saul); Assessment Reports 3819, 3821, 4031.

MOSQUITO KING, EX (No. 150, Fig. A)

By E. Sadar

LOCATION: Lat. 51° 03.6′ Long. 119° 32.3′ (82M/4E, 3W)
KAMLOOPS M.D. Between 5,000 and 6,000 feet elevation on Adams Plateau, east of Adams Lake and north of Scotch Creek.

CLAIMS: The company holds a substantial number of claims including several Crown grants on the Adams Plateau. The Key claims are the EX, EX 1, EX Fraction, SPAR, ELK 5, and ELK 8.

ACCESS: The property is reached by 20 miles of good road from Celesta.

OWNER: GIANT METALLICS MINES LIMITED, 301, 845 West Pender Street, Vancouver 1.

METALS: Silver, lead, zinc (production shown on Table I).

DESCRIPTION: Sphalerite, galena, and pyrrhotite occur in the west limb of a refolded northerly trending anticline.

WORK DONE: Five men were employed test drilling. Approximately 234 tons of test mill samples was mined and shipped to the Kam-Kotia mill at Sandon.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 317; 1971, p. 436.

PAT (No. 1, Fig. A)

LOCATION: Lat. 51° 00.5′ Long. 119° 45′ (82M/4E)
KAMLOOPS M.D. On the southwest shore of Adams Lake, 3 miles southwest of Skwaam Bay, 44 miles northeast of Kamloops.
CLAIMS: PAT 2 and 3.
ACCESS: By road from Kamloops.
OPERATOR: BUCHANAN MINES LTD. (now Complex Ore Research and Development Ltd.), 15816 – 112th Avenue, Edmonton, Alta.
METAL: Copper.
DESCRIPTION: Lenses of chalcopyrite and pyrrhotite occur in schistose metavolcanic rocks.
WORK DONE: Geological survey during 1971.
REFERENCE: Assessment Report 3510.

A (No. 123, Fig. A)

LOCATION: Lat. 51° 05′ Long. 119° 31′ (82M/4E)
KAMLOOPS M.D. East of Gilford Lake, at the headwaters of Nikwikwaia Creek, 11 miles east of Skwaam Bay.
CLAIMS: A 1 to 18.
ACCESS: By helicopter from Revelstoke, 60 miles.
OWNER: ORELL COPPER MINES LTD., Box 886, Salmon Arm.
WORK DONE: Line-cutting.
REFERENCE: Assessment Report 4048.

KAREN, AGATE (No. 152, Fig. A)

LOCATION: Lat. 51° 05′ Long. 119° 45′ (82M/4)
KAMLOOPS M.D. At 2,500 feet elevation on the west side of Adams Lake, 25 miles southeast of Barriere.
CLAIMS: KAREN, AGATE, TAC, VAL, ASTRO, TEE, RAD, JO, totalling 47.
ACCESS: By gravel road from Barriere.
OPERATOR: ADAMS LAKE MINING LTD., 2173 Dundas Street, Vancouver 6.
METALS: Silver, lead, zinc.
DESCRIPTION: Galena, argentite, sphalerite, and minor chalcopyrite occur in quartz veins and in foliation planes in quartz-sericite-talc schists.
WORK DONE: Geological mapping, 1 inch equals 100 feet; line-cutting, 5 miles; geochemical and electromagnetic surveying.
REFERENCE: *Minister of Mines, B.C.*, Ann. Rept., 1961, p. 53; Assessment Reports 4134, 4135.

HOMESTAKE (No. 121, Fig. A) By E. Sadar

LOCATION: Lat. 51° 06.7′ Long. 119° 49.5′ (82M/4W)
KAMLOOPS M.D. At approximately 3,000 feet elevation on Homestake Creek, 3 miles west of Skwaam Bay.

(82M/4W)

CLAIMS: Several Crown-granted claims including HOMESTAKE, ARGENTUM, MAPLELEAF, TROUBLESOME, SILVERSTAR and approximately 100 recorded claims including JOE, KAM, H, MAX.

ACCESS: By the Louis Creek-Skwaam Bay road, 3 miles west from Skwaam Bay.

OWNER: KAMAD SILVER CO. LTD., 301, 141 Victoria Street, Kamloops.

METALS: Barite, silver, copper, lead, zinc.

DESCRIPTION: Various veins and stringers host barite, tetrahedrite, galena, sphalerite, pyrite, chalcopyrite, argentite, and minor amounts of native silver.

WORK DONE: Road construction, 1.2 miles (Skwaam Bay road up Homestake Creek); drifting, crosscutting, and raising, 2,393 feet on Homestake and Troublesome; surface diamond drilling, five holes totalling 2,599 feet on Homestake and Troublesome; underground diamond drilling, eight holes totalling 1,545 feet on Homestake.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 317; 1971, p. 437.

PINE (No. 88, Fig. A)

LOCATION: Lat. 51° 00.8'-03.5' Long. 119° 45.5'-49' (82M/4W)

KAMLOOPS M.D. Between 4,100 and 4,500 feet elevation at the headwaters of Cicero Creek, 1.5 miles south and southwest of Skwaam Bay on Adams Lake.

CLAIMS: PINE, totalling 49.

ACCESS: By 8 miles of old logging road from Forest Lake on the Louis Creek-Skwaam Bay road.

OWNER: Derry Michener & Booth.

OPERATOR: NORTH THOMPSON SYNDICATE, Box 795, Vernon.

METALS: Lead, zinc, copper.

DESCRIPTION: Chalcopyrite, galena, and sphalerite occur in fractures in quartz-chlorite-sericite schist and quartzite. Pyrrhotite with minor chalcopyrite also occurs in skarn.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 200 feet covering Pine 1-3 and 50-59; ground magnetometer survey, 7 line-miles covering 13 claims; geochemical soil survey, approximately 550 samples covering 30 claims.

EBL (No. 33, Fig. A)

LOCATION: Lat. 51° 17'-21' Long. 119° 45'-50' (82M/5W)

KAMLOOPS M.D. At approximately 3,500 feet elevation between North and East Barriere Lakes.

CLAIMS: EBL, B&B, NLSS, REM, BRAD, EL, SNARK, totalling 162.

ACCESS: By road from Barriere, 20 miles.

OWNER: Pan Ocean Oil Ltd.

OPERATOR: CRAIGMONT MINES LIMITED, 270, 180 Seymour Street, Kamloops.

METAL: Copper.

DESCRIPTION: Conformable zones of chalcopyrite, pyrite, and pyrrhotite mineraliza-

(82M/5W)

tion occur in sheared and chloritized acid volcanic rocks.

WORK DONE: Induced polarization and resistivity survey, 4 line-miles covering B&B 1, 2, 10-16, EBL 49, 50, 55A, 56A, and NLSS 2; road construction, 3 miles; surface diamond drilling 17 holes totalling 6,909 feet on B&B 11, 12, 14 and various EBL claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 438, 439; Assessment Reports 3431, 3884.

GOODLUCK, HARPER, ULTIMA (No. 15, Fig. A)

LOCATION: Lat. 51° 20'-21.3' Long. 119° 50'-52' (82M/5W)
KAMLOOPS M.D. At 6,000 feet elevation on the north shore of North Barriere Lake, 20 miles east of Barriere.

CLAIMS: GOODLUCK, HARPER, ULTIMA, ULTIMA EAST, CREEK, totalling 38.

ACCESS: By road from Barriere, 20 miles.

OWNER: Geneva Resources Ltd. (formerly Barriere Lake Minerals Ltd.).

OPERATOR: CRAIGMONT MINES LIMITED, 270, 180 Seymour Street, Kamloops.

METALS: Nickel, copper, zinc, silver.

DESCRIPTION: Conformable zones of pyrrhotite, pyrite, chalcopyrite, and sphalerite mineralization occur in altered rocks of the Cache Creek Group.

WORK DONE: Induced polarization survey, 8.33 line-miles; geochemical soil survey, 450 samples.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. pp. 313. 314; Assessment Report 3716.

MOE (No. 107, Fig. C)

LOCATION: Lat. 51° 23.5'-25.5' Long. 119° 59' - 120° 01.5' (92P/8E; 82M/5W)
Report on this property in section 92P/8E.

BC (No. 80, Fig. A)

LOCATION: Lat. 51° 20.7'-22.2' Long. 119° 55'- 120° 00' (82M/5W; 92P/8E)
KAMLOOPS M.D. At approximately 5,000 feet elevation on Birk Creek, 20 miles northeast of Barriere.

CLAIMS: BC 1 to 182.

ACCESS: By road from Barriere, 20 miles.

OWNER: CRAIGMONT MINES LIMITED, 270, 180 Seymour Street, Kamloops.

DESCRIPTION: Sedimentary and volcanic rocks of the Cache Creek Group are intruded by the Baldy batholith.

WORK DONE: Magnetometer survey, 100 line-miles; electromagnetic survey, 100 line-miles; geochemical soil survey, 2,000 samples covering BC 1-72, 83-182.

REFERENCE: Assessment Report 4136.

PY (No. 14, Fig. A)

LOCATION: Lat. 51° 28.5'-30.5' Long. 119° 50.6'-52.4' (82M/5W, 12W)
KAMLOOPS M.D. Between 3,800 and 4,100 feet elevation near Harper Creek, 8 miles north of North Barriere Lake.

CLAIMS: PY 1 to 43.

ACCESS: By road from Barriere, approximately 20 miles.

OPERATOR: BPOG OPERATIONS LTD., 335 Eighth Avenue SW., Calgary, Alta.

DESCRIPTION: The area is underlain by low-grade metamorphic rocks (Permian or older) dominated by impure limestones, phyllitic greenschist, dark grey phyllite, and sericitic quartzite.

WORK DONE: Line-cutting covering PY 35-40; magnetometer survey, 22 line-miles covering PY 1-30.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 439; Assessment Report 3781.

NSP (No. 84, Fig. A)

LOCATION: Lat. 51° 16'-18' Long. 119° 35'-40' (82M/5E)
KAMLOOPS M.D. At approximately 4,500 feet elevation on ridge south of East Barriere River, 6 miles east of East Barriere Lake.

CLAIMS: NSP 1 to 64.

ACCESS: By road from East Barriere Lake, 6 miles.

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: Chalcopyrite occurs as disseminations and in thin quartz stringers parallel to the foliation in quartz-biotite gneiss which is intercalated with granite of the Baldy batholith and schist and volcanic rocks of the Adams Lake Group.

WORK DONE: Geochemical silt survey, 67 samples covering 26 claims.

ZOTL (No. 91, Fig. A)

LOCATION: Lat. 51° 26.5'-28' Long. 119° 36.5'-39' (82M/5E)
KAMLOOPS M.D. At approximately 3,500 feet elevation at the headwaters of Fennell Creek, about 10 miles southeast of Vavenby.

CLAIMS: ZOTL 1 to 34.

ACCESS: By road from Barriere, 55 miles.

OWNER: CAMBRIDGE MINES, LIMITED, 420 Howe Street, Vancouver 1.

DESCRIPTION: The claims include the northeastern contact area between the Adams Lake-Harper Creek batholith of coarse-grained white to pink granite with coarse to medium-grained quartz feldspar biotite gneiss believed to be the metamorphic equivalent of Carboniferous sedimentary rocks.

WORK DONE: Surface geological mapping, 1 inch equals 500 feet; magnetometer survey, 5.5 line-miles; and geochemical soil survey, 140 samples covering Zotl 1 to 10.

HILLTOP, BOB (No. 4, Fig. A)

LOCATION: Lat. 51° 29′ Long. 119° 38′ (82M/5E, 12E)
KAMLOOPS M.D. On the headwaters of Fennell and Otter Creeks, 22 miles northeast of Barriere Lake.
CLAIMS: HILLTOP, BOB, HISSY, FILL, totalling approximately 134.
ACCESS: By North Barriere Lake road, 22 miles.
OPERATOR: DYNASTY EXPLORATIONS LIMITED, 330, 355 Burrard Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Chalcopyrite is disseminated in a highly sheared to brecciated chlorite schist.
WORK DONE: Geological mapping, magnetometer survey, and geochemical survey during 1971.
REFERENCE: Assessment Report 3430.

VA, VM (No. 74, Fig. A)

LOCATION: Lat. 51° 30.5′ Long. 119° 43′ (82M/12E)
KAMLOOPS M.D. Between 4,500 and 5,000 feet elevation at the headwaters of Barriere River, 5 miles south of Vavenby.
CLAIMS: VA 44, 46, 48, 50, 52, 53 to 78, 108, 110, 112, 123, 124, 137 to 140; VM 2, 4 to 10, 13 to 22, 25 to 36, 61 to 80.
ACCESS: By logging road from Vavenby, 5 miles.
OWNER: Pan Ocean Oil Ltd.
OPERATOR: CARIBOU SYNDICATE, 202, 850 West Hastings Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Permian and older metamorphosed sedimentary and volcanic rocks are in contact with granitic rocks of the Baldy batholith.
WORK DONE: Surface workings mapped; surface geological mapping, 1 inch equals 40 feet covering VM 5-8 and 1 inch equals 200 feet covering VM 61-66; trenching, 2,960 feet on VM 5-8 amd 61-66.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 442.

CAP, PAC (No. 71, Fig. A)

LOCATION: Lat. 51° 31′ Long. 119° 40′ (82M/12E)
KAMLOOPS M.D. On Vavenby Mountain, 4.5 miles southeast of Vavenby.
CLAIMS: CAP 1 to 4, PAC 5 to 20.
ACCESS: By helicopter from Vavenby.
OWNER: W. E. MacDONALD, 12209 McMyn Avenue, Pitt Meadows.
WORK DONE: Line-cutting.
REFERENCE: Assessment Report 3941.

ROB (No. 95, Fig. A)

LOCATION: Lat. 51° 34'-36' Long. 119° 30'-31.5' (82M/12E)
KAMLOOPS M.D. At approximately 4,200 feet elevation south of upper Reg Christie Creek, 11 miles east of Vavenby.
CLAIMS: ROB 1 to 30.
ACCESS: By logging road from Vavenby, 14 miles.
OWNER: Derry Michener & Booth.
OPERATOR: NORTH THOMPSON SYNDICATE, Box 795, Vernon.
METAL: Copper.
DESCRIPTION: Disseminated pyrite, pyrrhotite, and chalcopyrite occur in volcanic rocks, chlorite schist, and quartz-sericite schist.
WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 200 feet; ground magnetometer survey, 7 line-miles; and geochemical soil survey, 227 samples covering Rob 3, 5, 7, and 15-22; percussion drilling, two holes totalling 600 feet on Rob 18 and 20.

MARA (No. 133, Fig. A)

LOCATION: Lat. 51° 42' Long. 119° 41' (82M/12E)
KAMLOOPS M.D. At approximately 3,700 feet elevation at Hole in the Wall Pass, 8 miles north-northeast of Vavenby.
CLAIM: MARA 2.
ACCESS: By forestry road from Highway 5, 2 miles.
OWNER: ROBERT J. FRANKS, Box 70, Vavenby.
DESCRIPTION: Interest was focused on a shear zone in schist.
WORK DONE: Stripping, 15,000 square feet on Mara 2.

GABRO (No. 131, Fig. A)

LOCATION: Lat. 51° 39' Long. 119° 40' (82M/12E)
KAMLOOPS M.D. At approximately 1,500 feet elevation near Irvine Station, in the riverbed of the North Thompson River, 6 miles northeast of Vavenby.
CLAIMS: GABRO 1 and 2.
ACCESS: By Highway 5 from Vavenby, 6 miles.
OWNER: ROBERT J. FRANKS, Box 70, Vavenby.
METALS: Copper, cobalt, silver.
DESCRIPTION: Traces of copper, silver, and cobalt occur in quartz carbonate veins in a basic intrusive (gabbro ?).
WORK DONE: Trenching.

BRENDA (No. 132, Fig. A)

LOCATION: Lat. 51° 36' Long. 119° 52' (82M/12W)
KAMLOOPS M.D. At approximately 2,500 feet elevation on the north side of the North Thompson River, at the mouth of Crossing Creek.

(82M/12W)

CLAIM: BRENDA 4.
ACCESS: By logging road from Highway 5, 1 mile.
OWNER: ROBERT J. FRANKS, Box 70, Vavenby.
METALS: Gold, silver, lead, copper.
DESCRIPTION: Gold, silver, lead, and copper occur within limestone quartz veins.
WORK DONE: Trenching, 2,000 feet; stripping, 2,000 feet.
REFERENCE: *Minister of Mines, B.C.*, Ann. Rept., 1968, p. 163.

REXSPAR (No. 122, Fig. A)

LOCATION: Lat. 51° 33′ Long. 119° 55′ (82M/12W)
KAMLOOPS M.D. At 4,000 feet elevation on Foghorn Creek, 3 miles south of Birch Island.
CLAIMS: REX, SPAR, RADIO, PA, JAM, JANE, ELLA, TOP, RAY, ACTIVE, LIL, CF, CS, totalling 265.
ACCESS: By road from Birch Island, 7 miles.
OWNER: Consolidated Rexspar Minerals and Chemicals Limited.
OPERATOR: DENISON MINES LIMITED, 4 King Street West, Toronto, Ont.
METALS: Uranium, fluorite, molybdenite, lead, rare earths, celestite.
DESCRIPTION: Lenticular, zoned, polymetallic replacement masses, restricted to a moderately dipping trachyte formation of Permian age or younger, contain fluorite and uranium minerals.
WORK DONE: Geochemical soil survey, 186 samples; trenching on Spar 2; surface diamond drilling, seven holes totalling 2,373 feet on Rex 12 and Spar 2.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 301; Assessment Report 4032.

FH (No. 39, Fig. A)

LOCATION: Lat. 51° 31′ Long. 119° 58′ (82M/12W)
KAMLOOPS M.D. At approximately 6,000 feet elevation on Foghorn Creek, 5 miles south of Birch Island.
CLAIMS: FH 1 to 29, 31 to 40, FOGHORN Fraction.
ACCESS: By very steep and rough road from Birch Island, 10 miles.
OPERATORS: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5 and QUEBEC CARTIER MINING COMPANY, 1418, 355 Burrard Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Pyrite, pyrrhotite, and chalcopyrite occur in lenses and stringers in chloritic and sericitic schists. These sulphides also occur in quartz veins.
WORK DONE: Underground workings mapped; surface geological mapping, 1 inch equals 400 feet covering FH 1-6, 9, 10, 14, 18, 20, 22, and Foghorn Fraction; magnetometer survey, 1.7 line-miles covering FH 2 and 4; geochemical soil survey, 171 samples covering FH 1-4, 6, 9, 15-18, 20; geochemical silt survey, 89 samples covering FH 3, 5-8, 19-24, 34; surface diamond drilling, five holes totalling 2,294 feet on FH 2, 16, and 18.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 230; 1970, pp. 302, 303; Assessment Report 3820.

GOOF, SUE, HAIL (No. 87, Fig. A)

LOCATION: Lat. 51° 31' Long. 119° 48.3' (82M/12W)
KAMLOOPS M.D. Head of Harper Creek, 5.75 miles southeast of Birch Island.

CLAIMS: GOOF, SUE, BETH, HARP, LEO, JUDY, MUF, HAIL, KARINA, BOB, totalling approximately 338.

ACCESS: By road from Birch Island, 15 miles.

OWNERS: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5 and QUEBEC CARTIER MINING COMPANY, 1418, 355 Burrard Street, Vancouver 1.

METALS: Copper, lead, zinc.

DESCRIPTION: Chalcopyrite and pyrite with minor sphalerite and galena occur in quartz lenses and as disseminatons in schist and phyllite.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Judy 5, 7, 9, Beth 2, 4, 6, and Leo 33, 34, 42; electromagnetic survey, 24.9 line-miles covering Beth 1-8, Judy 3, 5, 7, 9, 11, Leo 33-38, 42, 44, 46, Hail 590, 711; induced polarization survey, 7.4 line-miles covering Beth 1-8, Judy 3, 5, 7, 9, 11, Leo 33-36, 42, Hail 590, 711; geochemical soil survey, 549 samples covering Judy 5, 7, 9, 11; geochemical silt survey, 46 samples covering Beth 1-8; surface diamond drilling, five holes totalling 1,801 feet on Sue 6, Hail 18, Bob 2, Hail 19, Leo 33.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 443.

MOOSE (No. 70, Fig. A)

LOCATION: Lat. 51° 53.5' Long. 119° 44' (82M/13)
KAMLOOPS M.D. At 5,000 feet elevation at the headwaters of Maxwell Creek, 20 miles northeast of Clearwater.

CLAIMS: MOOSE 1 to 20.

ACCESS: By helicopter from Clearwater, 20 miles.

OWNER: L. G. White.

OPERATOR: CARIBOU SYNDICATE, 202, 850 West Hastings Street, Vancouver 1.

WORK DONE: Geological mapping, 1 inch equals 400 feet; magnetometer, electromagnetic, and geochemical surveys.

REFERENCE: Assessment Report 3935.

SUMMIT (No. 82, Fig. A)

LOCATION: Lat. 51° 50' Long. 119° 50' (82M/13W)
KAMLOOPS M.D. At approximately 6,000 feet elevation on the north side of Trophy Mountain, 1.5 miles east-northeast of Summit Lake, 17 miles east-northeast of Clearwater.

(82M/13W)

CLAIMS: SUMMIT, totalling 18.
ACCESS: By helicopter from Clearwater, 17 miles.
OWNER: TriNat Resources Ltd.
OPERATOR: CHANDALAR RESOURCES LIMITED (formerly Continental McKinney Mines Limited), 201, 2910 – 30th Avenue, Vernon.
METALS: Silver, copper, lead, zinc.
WORK DONE: Surface geological mapping; magnetometer survey.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 230.

BOULDER (No. 158, Fig. A)

LOCATION: Lat. 51° 50.5′ Long. 119° 43′ (82M/13W)
KAMLOOPS M.D. At approximately 4,000 feet elevation on Maxwell Creek, 3 miles northwest of its confluence with the Raft River and 17 miles west of Avola.
CLAIMS: BOULDER 1 to 32.
ACCESS: By logging road from Clearwater, 33 miles.
OWNER: UNION CARBIDE EXPLORATION CORPORATION, 601, 1112 West Pender Street, Vancouver 1.
METAL: Tungsten.
DESCRIPTION: Scheelite occurs in a skarn deposit.
WORK DONE: Surface geological mapping, 1 inch equals 50 feet covering Boulder 1, 3, and 11; geochemical dust and grab rock survey, 40 samples; trenching, 3,100 feet on Boulder 1, 3, and 11; surface diamond drilling, eight holes totalling 1,768 feet.
REFERENCE: Assessment Report 4270.

GOLDEN 82N

WATERLOO (No. 86, Fig. A)

LOCATION: Lat. 51° 10′ Long. 116° 23′ (82N/1W)
GOLDEN M.D. At approximately 7,000 feet elevation at the headwaters of Moose Creek, 30 miles southeast of Golden.
CLAIMS: WATERLOO 1 to 6, 9 to 14, RIVER 1 to 4.
ACCESS: By highway, trail, and helicopter from Golden, 30 miles.
OWNER: PURCELL DEVELOPMENT CO. LTD., Brisco.
METALS: Silver, lead, zinc.
DESCRIPTION: Sphalerite, galena, pyrrhotite, and chalcopyrite occur in limestone and calcareous shale. Some uranium minerals are also present.
WORK DONE: Geochemical survey covering all claims; 50 acres on Waterloo 9 and 10 bulk sampled.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 443.

(82N/4E)

ICE (No. 85, Fig. A)

LOCATION: Lat. 51° 02′ Long. 117° 43′ (82N/4E)
REVELSTOKE M.D. At approximately 7,000 feet elevation at the head of Albert Creek, 8 miles southeast of Albert Canyon and 20 miles east of Revelstoke.

CLAIMS: ICE 1 to 60.

ACCESS: By helicopter from Revelstoke, 21 miles.

OWNER: UNION CARBIDE EXPLORATION CORPORATION, 601, 1112 West Pender Street, Vancouver 1.

METAL: Tungsten.

DESCRIPTION: Scheelite occurs in skarn, quartz veins, and fractures in quartzite.

WORK DONE: Surface diamond drilling, 1 inch equals 400 feet covering Ice 35-48 and 53-60.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 444.

EX, AC (No. 72, Fig. A)

LOCATION: Lat. 51′ 03′-09′ Long. 117° 42′-53′ (82N/4)
REVELSTOKE M.D. At approximately 8,000 feet elevation on Albert Creek, southeast of Albert Canyon, 21 miles east of Revelstoke.

CLAIMS: EX, AC, AD, NE, Y, totalling 400.

ACCESS: By Trans-Canada Highway and logging road from Revelstoke.

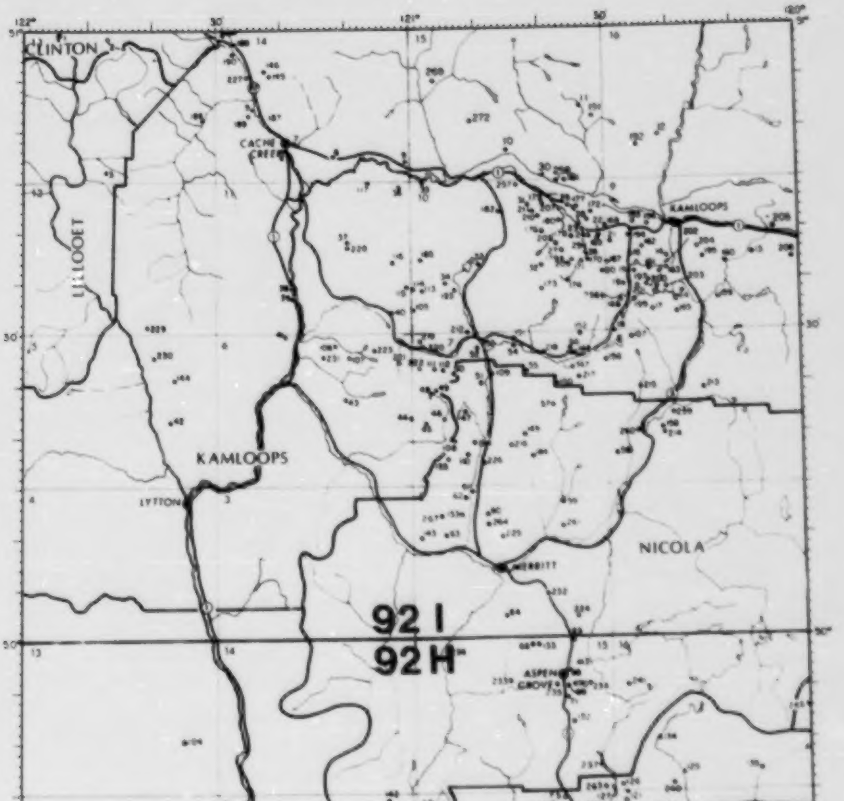
OWNER: CANADA TUNGSTEN MINING CORPORATION LIMITED, 505, 67 Richmond Street West, Toronto, Ont.

METALS: Tungsten, copper, molybdenum, zinc.

DESCRIPTION: Scheelite occurs with skarn in a limestone lens in a quartz feldspar biotite gneiss roof pendant in a granodiorite stock.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet covering all claims; road improved from Albert Canyon to property.

REFERENCE: Assessment Report 3940.


122°
30'
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CLINTON
CACHE CREEK
LILLOOET
KAMLOOPS
KAMLOOPS
LYTTON
NICOLA
MERRITT
92 I
92 H
ASPEN GROVE
NEW WESTMINSTER
SIMILKAMEEN
PRINCETON
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155. OXBOW, page 158.
156. MANDY, page 185.
157. J, page 187.
158. SHER, page 186.
159. SUN, MOON, page 188.
160. DIV, AB, page 188.
161. PAM, page 193.
162. MAKAOO, page 196.
163. IM, page 194.
164. JOKER, page 191.
165. NY, page 189.
166. ADD, TIN, page 190.
167. A, ROCK, page 196.
168. ZZ, page 198.
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170. SHELLY (MILESTONE - MONTEREY), page 201.
171. SHELLY (COAST INTERIOR), page 201.
172. RPM, page 207.
173. TC, SPUR, OP, page 200.
174. ELLA, page 199.
175. LIL, PINE, page 206.
176. BW, KM, page 204.
177. SAGE, HILL, page 206.
178. BOW, page 203.
179. QQ, page 202.
180. JAM, TT, page 205.
181. KL, page 221.
182. BERU, page 223.
183. GB, ELLA, page 222.
184. OLD ALAMEADA, LAST CHANCE, page 180.
185. SPEC, page 224.
186. R, page 228.
187. T, page 231.
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189. HAM, EGGS, page 231.
190. BOND, BB, page 233.
191. CAN, page 234.
192. W, page 236.
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215. PAUL, page 187.
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221. SHEBA, page 163.
222. LORNEX, page 150.
223. OK (ALWIN) MINE, page 155.
224. BUD, page 143.
225. VAL, page 145.
226. TIL, page 159.
227. MAGGIE MINE, page 232.
228. HY (GIBBEX), page 226.
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238. SOUTH MDA, page 131.
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242. FAN, page 129.
243. WHIP, SAW, PICK, page 119.
244. MAE, KERRY, page 118.
245. NEV, page 119.
246. FGP, page 121.
247. SILVERTIP (S&M, MARION), page 118.
248. OWL, STAR, BOB, page 123.
249. FRASER VALLEY LIME, page 600.
250. CHEAM MARL PRODUCTS, page 604.
251. VALLEY GRANITE PRODUCTS, page 581.
252. EVE, TAX, page 116.
253. AUFEAS, page 116.
254. PRIDE OF EMORY MINE, page 117.
255. COLDWATER (KEYSTONE), page 132.
256. TOP, page 199.
257. GUS, page 257.
258. HILLTOP, SAGE, page 209.
259. TRUMP, page 187.
260. TL, page 186.
261. HANK, CU, page 144.
262. T, page 120.
263. ESP, page 135.
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HOPE 92H

IT (No. 270, Fig. B)

LOCATION: Lat. 49° 04'-06' Long. 120° 17'-21' (92H/1W)
OSOYOOS M.D. At approximately 6,500 feet elevation straddling Ashnola River between McBride and Duruisseau Creeks.

CLAIMS: IT 1 to 79.

ACCESS: From Keremeos by the gravel Ashnola forest access road, 29 miles.

OWNER: Ashnola Prospecting Syndicate.

OPERATOR: MINERAL MOUNTAIN MINING CO. LTD., 506, 540 Burrard Street, Vancouver 1.

DESCRIPTION: The country rock is a fine-grained, dark green andesite, probably of the Nicola Group. A breccia zone contains fragments of dacitic crystal tuff, similar to Kingsvale volcanic rocks to the north and east, and andesite.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet; induced polarization survey, 2 line-miles covering It 11-16; geochemical survey covering IT 11-16.

REFERENCES: Assessment Reports 4377, 4378, 4379.

ASH, NOLA (No. 89, Fig. B)

LOCATION: Lat. 49° 07.5' Long. 120° 20.2' (92H/1W)
OSOYOOS M.D. At approximately 6,500 feet elevation near the confluence of McBride Creek and Ashnola River, 25 miles south-southeast of Princeton.

CLAIMS: ASH, NOLA, JAM, CAR, Q, GC, CAT, MAX, McBRIDE, totalling 159.

ACCESS: By the Ashnola River forestry road from Keremeos, 30 miles.

OWNER: Prism Resources Limited.

OPERATORS: GETTY MINES, LIMITED (joint venture with CYPRUS EXPLORATION CORPORATION, LTD.), 1904, 1177 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: The area of the main showing is underlain by volcanic rocks of the Kingsvale Group which consist primarily of rhyolites. Intruded into the rhyolite is a small stock of quartz monzonite porphyry. The rhyolites exhibit a hydrothermal alteration zoning outward from the stock.

WORK DONE: Trenching on Nola 1 and 2; surface diamond drilling, six holes totalling 2,969 feet on Nola 8, 10, 17, 21, 23 and Nola 1 Fraction; rotary drilling, two holes totalling 312 feet on Nola 5 and 23; percussion drilling, 15 holes totalling 1,610 feet on Nola 1, 3, 5, 11, 22, 23, 41, Nola 1 Fraction, Cat 6, GC 1, and Q 47.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 256; Assessment Report 3457.

A, B, C (No. 87, Fig. B)

LOCATION: Lat. 49° 11.5'-14' Long. 120° 38.5'-43' (92H/2E)
SIMILKAMEEN M.D. Eighteen miles south-southwest of Princeton, on the north side of Copper Creek, the northern boundary of Manning Park.
CLAIMS: A 1 to 54, B 1 to 20, C 1 to 20, D 1 to 20, E 1 to 20, X 21 to 40.
ACCESS: By Highway 3 and logging road from Princeton.
OPERATORS: LEEMAC MINES LTD., 210, 890 West Pender Street, Vancouver 1 and KOMO EXPLORATIONS LTD., 10th Floor, 549 Howe Street, Vancouver 1.
WORK DONE: Airborne magnetometer survey, 50 line-miles and geochemical survey, 32 line-miles during 1971.
REFERENCES: Assessment Reports 3653, 3654.

EE, RAM (No. 88, Fig. B)

LOCATION: Lat. 49° 11.7'-14.0' Long. 120° 30.5'-32' (92H/2E)
SIMILKAMEEN M.D. At elevations of 3,000 to 4,800 feet at the junction of Belgie Creek, on the east bank of the Similkameen River, 16 miles south of Princeton.
CLAIMS: EE 1 to 20, RAM 25 to 48, RA 1, RA 1 and 2 Fractions.
ACCESS: By Highway 3 from Princeton.
OPERATOR: TEKNOL MINING CO. LTD., 1029, 510 West Hastings Street, Vancouver 2.
DESCRIPTION: The claims are underlain by Upper Triassic rocks of the Nicola Group.
WORK DONE: Magnetometer and electromagnetic surveys, 19.6 line-miles.
REFERENCE: Assessment Report 3597.

G (No. 86, Fig. B)

LOCATION: Lat. 49° 14.5' Long. 120° 32.5' (92H/2E, 7E)
SIMILKAMEEN M.D. Five miles north of Similkameen Falls, 15 miles south of Princeton.
CLAIMS: G 2, 4, 6, 8, 26, 28 to 42.
ACCESS: By Highway 16 from Princeton, 16 miles.
OPERATOR: LEEMAC MINES LTD., 210, 890 West Pender Street, Vancouver 1.
WORK DONE: Magnetometer survey during 1971.
REFERENCE: Assessment Report 3493.

AM (No. 136, Fig. B) By J. W. Robinson

LOCATION: Lat. 49° 09.8' Long. 121° 01.3' (92H/3E)
NEW WESTMINSTER M.D. Three miles south of the Hope-Princeton Highway near the western boundary of Manning Park.
CLAIMS: Approximately 190 full-sized and fractional claims including AM, CAMBORNE, LOIS, INVERMAY, VERNON, HANK, AXE, MISTY, MAY, BROWN, GC, BARB, GE, REX, RED, GM, and BARRY.

(92H/4E)

ACCESS: By the Hope-Princeton Highway from Hope a distance of 31 miles thence 3 miles south by mine road.

OWNER: GIANT MASCOT MINES LIMITED, Canam Division, Box 10010, Pacific Centre, Vancouver 1.

METALS: Copper, silver, molybdenum.

DESCRIPTION: A detailed geological description of this property is contained in the Annual Report of the British Columbia Minister of Mines and Petroleum Resources for 1965 but, in summary, copper mineralization occurs in pipe-like zones of brecciated sedimentary rocks containing some intrusions of gabbro.

WORK DONE:

Surface exploration on the south end of the main AM breccia zone consisted of bulldozer stripping and trenching. Sampling and geological mapping were carried out to provide additional information on the persistence and extent of the mineralization.

The road was repaired and was extended about 1 mile into the Twentysix Mile Creek area to enable crews to sample and geologically map a geochemically anomalous area known as the 26-mile zone. The 10 level and the 26-mile areas were further tested with induced polarization, electromagnetic, and magnetometer surveys and also with geochemical surveys. A diamond-drilling programme was started on the AM breccia zone and on the 10 level area.

During the season there was 651 feet of standard AX core drilled. There were 6,100 feet of trenches cut for sampling and 29,100 feet of line-cutting for geochemical and geophysical surveys. About 8 miles of road was repaired and 1 mile of new road was built. The 15 level portal shop which had been extensively damaged by the heavy snowfall was removed and the general area cleaned up.

REFERENCES: Kent, Paul, 1964, *Econ. Geol.,* Vol. 59, pp. 1551-1563; *Minister of Mines, B.C.,* Ann. Repts., 1965, pp. 206-212; 1968, p. 78; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, pp. 199, 200; 1970, p. 251; 1971, p. 257; Assessment Reports 4074, 4075.

MOUNTAIN GOAT (PIERCE MOUNTAIN) (No. 137, Fig. B)

LOCATION: Lat. 49° 04' Long. 121° 37' (92H/4E)
NEW WESTMINSTER M.D. Between 6,000 and 7,000 feet elevation on the west slope of Mount Pierce, 17 miles east-southeast of Chilliwack.

CLAIMS: MOUNTAIN GOAT 1 to 24.

ACCESS: By trail from the Chilliwack Lake road, 5 miles.

OWNER: BART MINES LTD., 710, 475 Howe Street, Vancouver 1.

DESCRIPTION: Pelite of the Cultus Formation (Upper Triassic) is in contact with basic flows of the Chilliwack Group.

WORK DONE: Magnetometer survey, approximately 4 line-miles and geochemical soil survey, 250 samples covering all claims; trenching, approximately 1,000 feet on Mountain Goat 1 and 2.

REFERENCE: *Minister of Mines, B.C.,* Ann. Rept., 1915, pp. 305, 306.

TAN (No. 138, Fig. B)

LOCATION:	Lat. 49° 00′-01.5′ Long. 121° 46′-50′ (92H/4W) NEW WESTMINSTER M.D. Between 2,000 and 4,000 feet elevation along the south side of Tamihi Creek, 12 miles south-southeast of Chilliwack.
CLAIMS:	TAN 1 to 14, 17 to 50.
ACCESS:	By road from Chilliwack, 23 miles.
OPERATOR:	COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 5.
METALS:	Copper, zinc.
DESCRIPTION:	Copper-zinc mineralization is associated with pyroclastic volcanic rocks of the Chilliwack Group of Pennsylvanian-Permian age.
WORK DONE:	Topography mapped; surface geological mapping, 1 inch equals 500 feet; induced polarization survey, 2 line-miles; geochemical soil and stream silt survey, 736 samples.
REFERENCE:	Assessment Report 4085.

FAB (No. 94, Fig. B)

LOCATION:	Lat. 49° 14.3′ Long. 121° 52.7′ (92H/4W) NEW WESTMINSTER M.D. Between 500 and 1,700 feet elevation on the southwest side of Mount Woodside, 3 miles east of Harrison Mills.
CLAIMS:	FAB 1 to 10.
ACCESS:	By Highway 7 from Harrison Mills.
OPERATOR:	GEOQUEST RESOURCES LTD., 430, 1155 West Georgia Street, Vancouver 5.
METALS:	Copper zinc.
DESCRIPTION:	Chalcopyrite, sphalerite, and pyrite occur as impregnations and veinlets in siliceous pyroclastic rocks of the Harrison Lake Formation of Middle Jurassic age.
WORK DONE:	Geological mapping, 1 inch equals 500 feet, and preliminary geochemical sampling during 1971 and 1972.
REFERENCE:	Assessment Report 3604.

HARRISON, LUCKY JIM (No. 140, Fig. B) By R. I. Thompson

LOCATION:	Lat. 49° 19′ Long. 121° 56.5′ (92H/5W; 92G/8E) NEW WESTMINSTER M.D. At approximately 1,000 feet elevation on Chehalis River, 6 miles north of Harrison Mills.
CLAIMS:	HARRISON, LUCKY JIM, CHEHALIS, JOY, BONANZA, POT, HILL, LH, C, DOROTHY, LYN, etc., totalling approximately 200.
ACCESS:	By road from Harrison Mills, 8 miles.
OPERATOR:	COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 5.
METALS:	Copper, zinc, silver.
DESCRIPTION:	

HISTORY: Discovery of lode occurrences on the west side of Harrison Lake (Fig. 4) initiated a rush of prospecting and claim staking in 1897-98. Preliminary results of

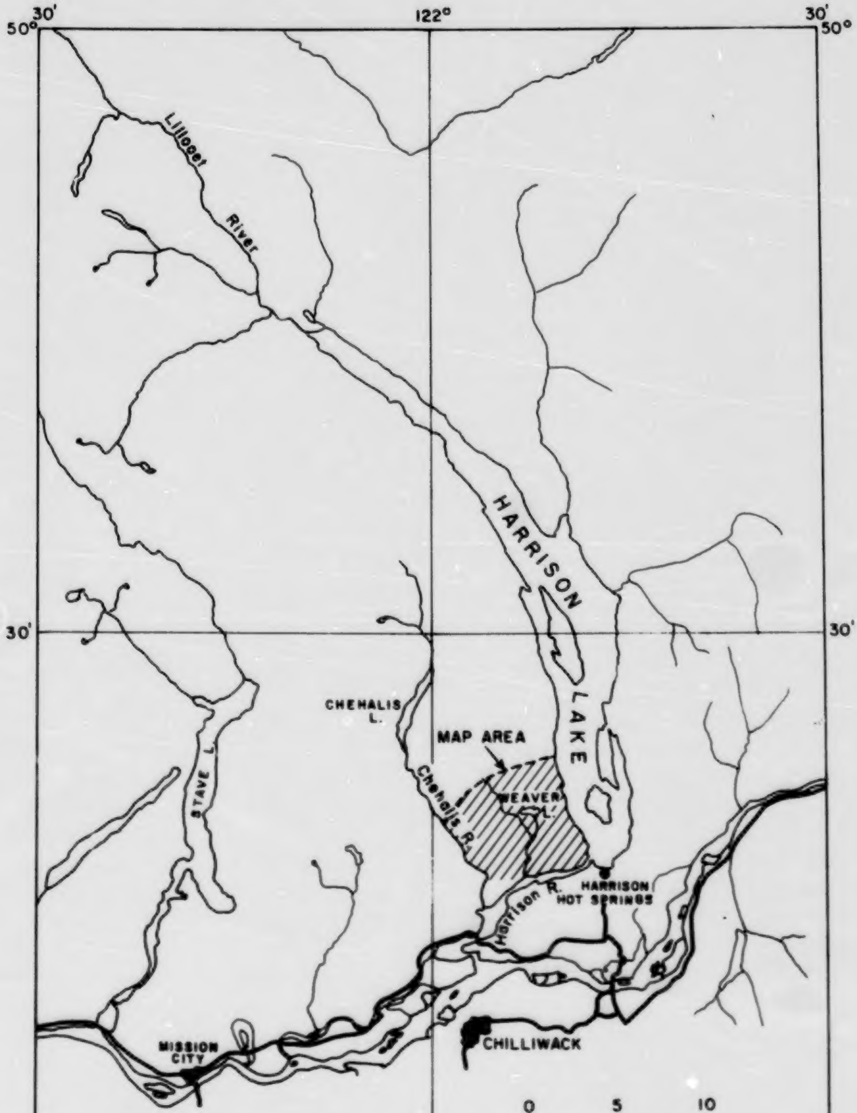

30'
122°
30'
50°
50°
Lillooet
River
HARRISON
LAKE
30'
30'
CHEHALIS L.
MAP AREA
STAVE L.
Chehalis R.
WEAVER L.
Harrison R.
HARRISON HOT SPRINGS
MISSION CITY
CHILLIWACK
0
5
10
MILES
0
10
20
KILOMETRES
49°
30'
122°
30'
49°

Figure 4. Index map showing the location of the Harrison Lake map-area.

development work in the Fire Mountain camp (located about 16 miles northwest of the head of Harrison Lake) and on the Providence (Province) claim group (located about 28 miles north of Harrison Hot Springs) heightened expectations for a new gold-silver district in British Columbia. However, interest in the area was short lived as both deposits soon proved to be uneconomic; total production during the period 1897-99 comprised 55 tons of ore (dollar value unknown) from the Fire Mountain camp, and 350 tons worth approximately $34 per ton (combined gold/silver) from the Providence mine.

In 1926, Crickmay completed the first systematic study of geology in the Harrison Lake area; he described the stratigraphic succession and established its age and nomenclature.

A brief revival of exploration interest in the area occurred in 1929 when the Harrison Gold Mining and Development Company did further development work on the Providence claim group, but without success. From 1930 to 1934 underground exploration resumed at Fire Mountain also without success. During the proceeding 25 years, the west side of Harrison Lake received little attention from exploration companies and prospectors.

Since 1960, exploration interest in the southwest side of Harrison Lake has increased, especially since 1969. A summary of available exploration information is provided in Table 1 and on Figure 5.

TABLE I. AVAILABLE ASSESSMENT REPORTS (*see* Figure 5).

No.	Claim Group	Submitter (date)	Salient Information
2833	Harrison, Lucky Jim	Zenith Mining Corp. Ltd. (1971)	Induced polarization survey.
2988	Harrison, Lucky Jim	Zenith Mining Corp. Ltd. (1971)	Line-cutting report.
3440	Iam, Mary J, Sir	Cominco Ltd. (1971)	Geological map and description; soil geochemical survey.
3441	Fe, RR	Cominco Ltd. (1971)	Geological map and description; mercury rock geochemical survey.
3490	Top	Cominco Ltd. (1972)	Geological map and description; stream-silt and soil geochemical survey; mercury rock geochemical survey.
3560	Pot	Cominco Ltd. (1972)	Geological map and description; mercury rock geochemical survey.
3627	He, Skip	E.D. Dodson and E. Burnett (1972)	Stream-silt geochemical survey.
3706	John, A	Green Land Mining Ltd. (1971)	Soil geochemical survey.
3729	Jump, Hop, Skip	E.D. Dodson (1972)	Stream-silt and soil geochemical survey.

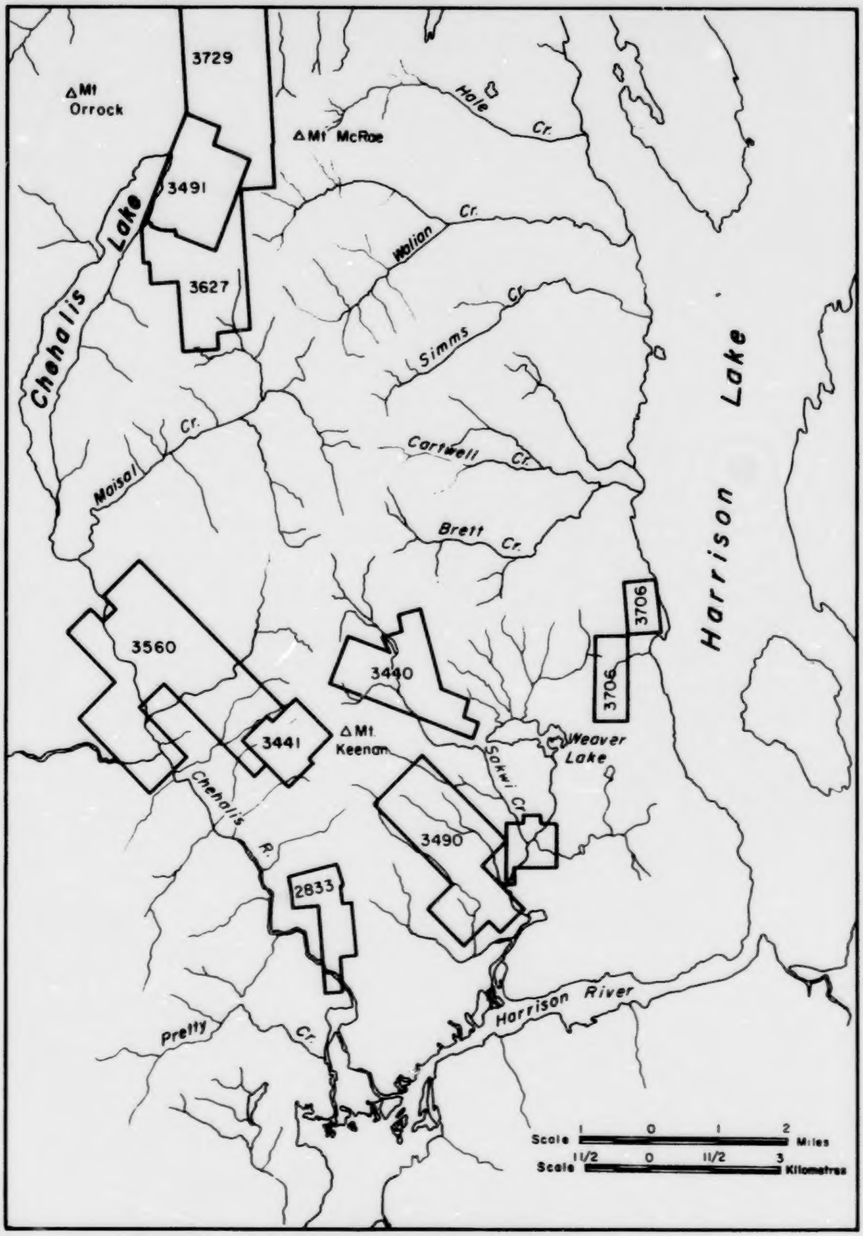

3729
Mt Orrock
Mt McRae
Hale Cr.
3491
Chehalis Lake
3627
Wolian Cr.
Simms Cr.
Maisal Cr.
Cartwell Cr.
Brett Cr.
Harrison Lake
3706
3706
3560
3440
3441
Mt. Keenan
Weaver Lake
Sakwi Cr.
Chehalis R.
3490
2833
Pretty Cr.
Harrison River
Scale 1 0 1 2 Miles
Scale 11/2 0 11/2 3 Kilometres

Figure 5. Index map showing claim groups on which reports have been accepted for assessment credit – numbers refer to Assessment Reports.

(92H/5W; 92G/8E)

The Seneca property (Harrison and Lucky Jim claims), a massive zinc-copper sulphide occurrence, was found on the east slope of lower Chehalis River in 1950-51 as a result of logging operations. Noranda Exploration Company, Limited optioned the property at that time and carried out a diamond-drill programme comprising 14 X-ray holes totalling 443 feet; however the results were not encouraging and the option agreement was terminated.

Stripping, trenching, and some underground development was initiated by M. Poschner (North Surrey) in the winter of 1961 during which time 287 tons of ore was mined and shipped to Britannia Beach for milling. Metal content of the ore was: 17 ounces gold, 959 ounces silver, 7,118 pounds copper, and 40,657 pounds zinc (*Minister of Mines, B.C.*, 1962, p. A47). However the operation did not establish sufficient ore reserves to warrant further development, and activity ceased in 1962. A brief report on the property (*Minister of Mines, B.C.*, Ann. Rept., 1962, p. 93) states:

> "....The claims are underlain by Middle Jurassic volcanic rocks....the rocks are amygdaloidal and massive andesites with lenses of agglomerate.
>
> "Mineralization in the adit consists of a number of thin quartz-pyrite stringers....The copper mineralization is very restricted, and there is no evidence that it may be a faulted segment of a nearby larger body."

Noland Mines, Limited held the property in 1964-65. A self potential survey was completed and two diamond-drill holes drilled south of the main showing as a check for a down-dip extension of mineralization; but none was encountered and the option agreement was terminated.

In 1969 Zenith Mining Corporation Ltd. bought the property. An anomalous zone southwest of the showing was outlined by an induced polarization survey and 10 closely spaced diamond-drill holes located across the zone; however only minor mineralization was encountered.

The property was optioned from Zenith by Cominco Ltd. in 1971. Until this time the zone of sulphide mineralization was visualized as part of a steeply dipping vein or shear system, and exploration was oriented toward establishment of a vertical dimension to the mineralized zone. However, detailed examination of host lithologies has shown them to have subhorizontal dips and to comprise acid pyroclastic rocks intercalated with volcanic-epiclastic rocks and some dark fine-grained friable material. The massive mineralization, some of which has a fragmental texture, is closely associated with the pyroclastic rocks. These and other features of the geologic setting led to the notion that the Seneca occurrence may comprise a conformable volcanogenic deposit similar in style to Kuroko-type and/or Noranda-type massive sulphide occurrences (Cominco geologists, personal communication, 1972). Accordingly, exploration over the past two years (1971-72) has been directed toward establishment of a lateral rather than vertical dimension to the mineralized zone, and in the search for conformable massive sulphide mineralization elsewhere in the region.

A four-week regional mapping project in the southern part of the Harrison Lake Formation was undertaken by the Mineralogical Branch in June 1972 to delineate the aerial distribution of rock types within the southern portion of the formation, and to establish whether the geological environment was consistent with gross lithologic and chemical relationships encountered proximal to Kuroko-type and Noranda-type massive

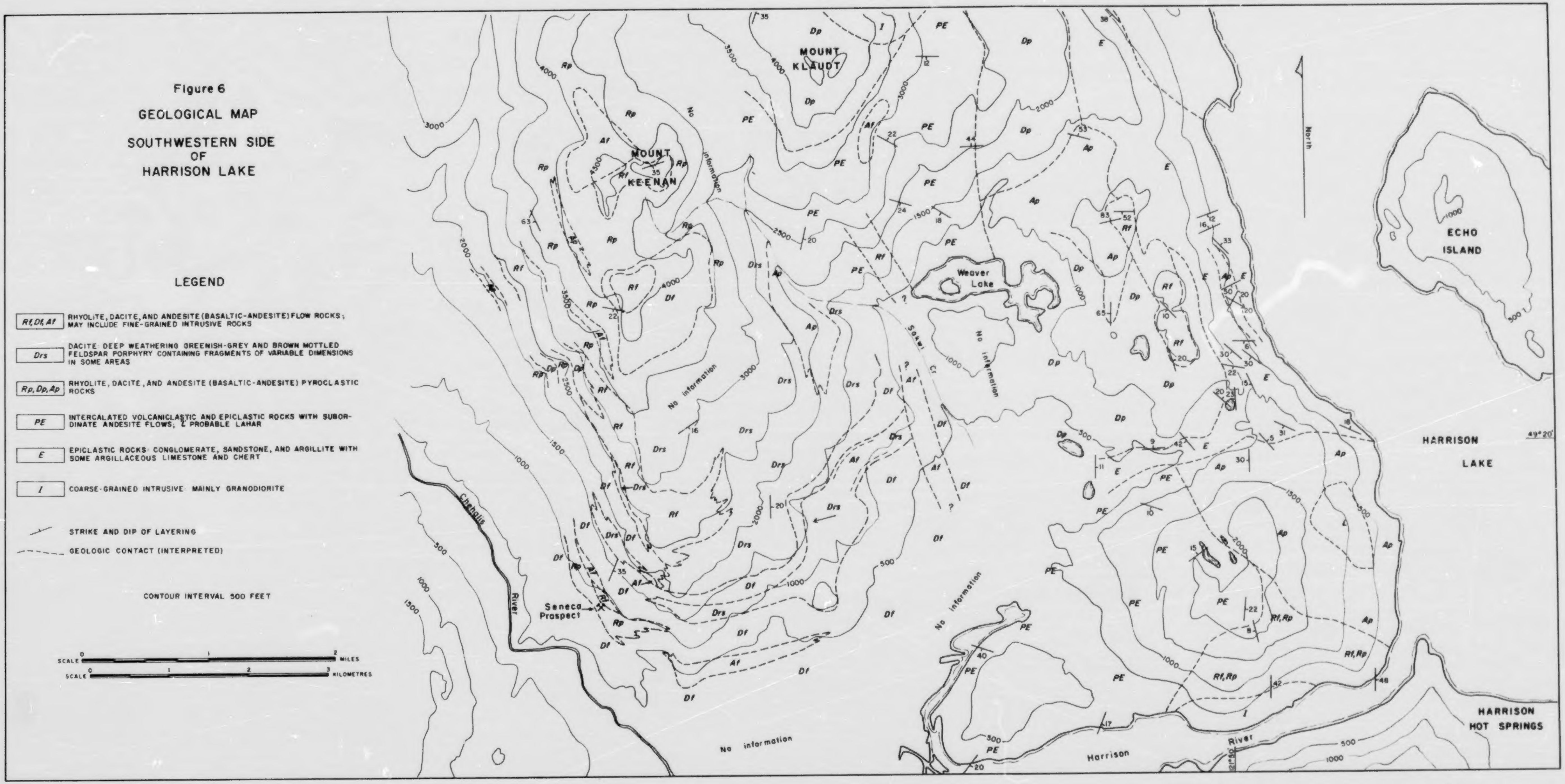


Figure 6

GEOLOGICAL MAP

SOUTHWESTERN SIDE
OF
HARRISON LAKE

LEGEND
Rf, Df, Af — RHYOLITE, DACITE, AND ANDESITE (BASALTIC-ANDESITE) FLOW ROCKS; MAY INCLUDE FINE-GRAINED INTRUSIVE ROCKS
Drs — DACITE: DEEP WEATHERING GREENISH-GREY AND BROWN MOTTLED FELDSPAR PORPHYRY CONTAINING FRAGMENTS OF VARIABLE DIMENSIONS IN SOME AREAS
Rp, Dp, Ap — RHYOLITE, DACITE, AND ANDESITE (BASALTIC-ANDESITE) PYROCLASTIC ROCKS
PE — INTERCALATED VOLCANICLASTIC AND EPICLASTIC ROCKS WITH SUBORDINATE ANDESITE FLOWS; L PROBABLE LAHAR
E — EPICLASTIC ROCKS: CONGLOMERATE, SANDSTONE, AND ARGILLITE WITH SOME ARGILLACEOUS LIMESTONE AND CHERT
I — COARSE-GRAINED INTRUSIVE: MAINLY GRANODIORITE
STRIKE AND DIP OF LAYERING
GEOLOGIC CONTACT (INTERPRETED)
CONTOUR INTERVAL 500 FEET
SCALE 0 1 2 MILES
SCALE 0 1 2 3 KILOMETRES
MOUNT KEENAN
MOUNT KLAUDT
Weaver Lake
Sakwi Cr.
ECHO ISLAND
HARRISON LAKE
HARRISON HOT SPRINGS
Harrison River
Chehalis River
Seneca Prospect
No information
North
49°20'
121°50'

sulpide occurrences. The following is a preliminary evaluation of the geologic data obtained.

REGIONAL GEOLOGIC SETTING: Harrison Lake Formation comprises a north-northwest trending belt of volcanic and volcanic-epiclastic rocks of probable Middle Jurassic age (Monger, 1970; Crickmay, 1962) which extends from Fraser River northward along the western side of Harrison Lake to its northern limit. The formation is part of the northwestern flank of the Cascade Fold Belt and juxtaposes the southeastern extremity of the Coast Crystalline Complex. Exposures of Harrison Lake Formation also occur as roof pendants within the Coast Crystalline Complex (Roddick, 1965).

Harrison Lake Formation is part of a eugeoclinal assemblage of marine-clastic and volcanic rocks which evolved from probable Middle Devonian through Middle Cretaceous time (McTaggart, 1970; Misch, 1966). This depositional regime was ended by widespread and intense orogenic activity from Early to mid-Late Cretaceous time. During this interval the fold belt assumed a two-sided nature (bilateral symmetry). An axial core of gneiss is bounded by fold and thrust belts with opposing senses of tectonic transport. This was accompanied by emplacement of granitic plutons of the Coast Crystalline Complex. It is suggested that the Coast Crystalline Complex and the Cascade Fold Belt are part of the same orogen exposed at different structural levels by erosion (McTaggart, 1970).

The area mapped is bounded to the west, east, and south by Chehalis River, Harrison Lake, and Harrison River respectively, and extends north from Harrison River approximately 6 miles.

STRATIGRAPHIC FRAMEWORK

Rock Classification: The map-area comprises a complexly interdigitating pile of volcanic, volcaniclastic, and epiclastic rocks which vary from porphyritic flows to sandstones and conglomerates. Field distinctions were made on the basis of rock composition (rhyolite-dacite-andesite-basalt) and texture (flow, pyroclastic, and epiclastic).

Total estimated stratigraphic thickness of the Harrison Lake Formation near its southern limits is at least 4,500 feet, the maximum topographic interval for the area. Crickmay (1925) reports an apparent thickness of 9,240 feet measured along the west shore of Harrison Lake.

The pyroclastic rocks are subdivided into two groups (after Fisher, 1961): 'primary,' those rocks comprising material derived from explosive volcanic activity which was not moved from its original place of deposition before lithification; and 'secondary,' those rocks comprising explosive volcanic material which was moved from its original site of deposition and redeposited before lithification. This latter category includes mudflow and landslide debris, and turbidite deposits.

A size classification has also been applied to the pyroclastic rocks in a very general way: 'tuff' refers to material up to and including sand size (approximately 2 millimetres in diameter), 'lapilli' refers to pea and walnut-sized fragments, and 'breccia' denotes fragments exceeding these dimensions.

The epiclastic category refers to those rocks derived from mechanically deposited material consisting of weathered products of older rocks. This includes rocks composed of eroded volcanic material as well as material of nonvolcanic origin.

Distribution of Rock Types

(1) Primary Pyroclastic Units (Rp, Dp, Ap): The western part of the map-area (Fig. 6; west of Sakwi Creek) comprises primary pyroclastic rocks of dacitic (Dp) and rhyolitic (Rp) composition intercalated with flows of the same composition; in the eastern half of the map-area (north and east of Weaver Lake) andesitic pyroclastic rocks (Ap) are more common, flows are less common, and all primary pyroclastic units contain a greater proportion of secondary pyroclastic and epiclastic material. Adjacent to Harrison Lake is a thick epiclastic unit interlayered with carbonaceous limestone and minor chert.

The primary pyroclastic units are generalizations which encompass many individual textural rock types. In general, lithic tuff (lapilli tuff) predominates, but volcanic breccia is important locally; crystal tuff and crystal lithic tuff are also present. Most of the rhyolite and dacite units are light to medium grey, competent aggregates of rhyolite and/or dacite fragments set in a fine, holocrystalline quartz feldspar (albite) matrix; quartz phenocrysts are often apparent in the rhyolite units; feldspar phenocrysts are not normally abundant; and chlorite and epidote are sometimes present as alteration products. The andesite units are normally green and brownish green; characteristically porphyritic andesite fragments are set in a fine-grained chloritized matrix of albite with lesser amounts of hornblende, pyroxene, and opaque oxides. Welded textures are not common, and there is little evidence of autobrecciation.

Most of the pyroclastic units are now massive and superficially featureless; aerial limits are difficult to establish, however some bedded tuffs and differentially eroded blocky breccias show that lateral continuity is slight and marked lateral lithologic variations are common.

(2) Flow Units (Rf, Df, Af): Dacite, rhyolite, and andesite flows form an important part of the lithologic succession west of Sakwi Creek. Massive, thick porphyritic dacite flows form the lower southern slope of Mount Keenan adjacent to Chehalis and Harrison Rivers. They are very competent light green to grey, fine-grained rocks containing (sparse) subhedral albite phenocrysts. Epidote and chlorite are present in minor amounts as replacements of phenocrysts and in the matrix. Both the rhyolite and andesite flows are thin and discontinuous. Rhyolite is light grey to tan and commonly contains conspicuous quartz phenocrysts together with subhedral albite and orthoclase. Andesite flows are generally dark green and amygdaloidal; plagioclase microlites are the dominant mineral constituent together with lesser amounts of hornblende and pyroxene, and minor chlorite and epidote. The amygdules are normally filled with chlorite and carbonate.

Map unit Drs is a distinctive porphyritic flow on the southern slope of Mount Keenan. It is a mottled, varicoloured (usually grey, greenish grey, and reddish brown) dacite with pronounced porphyritic texture. Exposed surfaces are characteristically deeply weathered and incompetent (for this reason the field name 'rotten stone' is applied to this unit). Recent road cuts reveal that part of the unit contains fragments which vary from lapilli size to large blocks several feet in diameter. The fragments are compositionally and texturally similar to the porphyritic matrix and appear to be accessory in origin.

(3) Secondary Pyroclastic Units (P-E): A thick unit of secondary pyroclastic rocks (P-E) occurs on the south slope of Mount Klaudt (north of Weaver Lake). Massive, chaotic and lenticular beds of coarse breccia are interlayered with: bedded tuffs and lapilli tuffs, sandstone, shale, carbonaceous limestone, and occasional andesitic and dacitic flows.

Much of the breccia comprises heterogeneous aggregates of subangular and rounded blocks of dacite and andesite set in a medium to fine-grained matrix of lithic fragments. In some localities, the ratio of blocks to matrix is very low with the blocks appearing to 'float' in the matrix. In other localities the blocks are closely packed with only subordinate interstitial matrix. The massive breccias appear to interfinger with primary pyroclastic rocks along strike to the east and west; however the actual manner in which this transition takes place is not known.

Volcanic greywacke units tend to be massive and consist of heterogeneous, poorly sorted rocks that display crudely developed graded bedding. Sedimentary structures such as cross-stratification, ripples, mud cracks, and laminations are absent.

Shale beds are thin (usually a few inches), sandy, and of minor importance. Some grade into thin carbonaceous limestones.

Andesite and dacite flows constitute thin lenticular masses of minor extent within the dominantly secondary pyroclastic units.

The succession of lithologies represented by unit P-E suggests that it comprises volcanic debris which was sloughed down the flank of a volcanic source area (from the north ?) in a shallow marine environment. The pulses of rapid sedimentation, personified by the coarse clastics, were interrupted, presumably, by short quiescent periods during which shale and carbonaceous limestone were deposited.

(4) Epiclastic Unit (E): The border of Harrison Lake comprises an epiclastic succession of conglomerate, sandstone, mudstone, and shale with interbeds of carbonaceous limestone and chert.

The conglomerate and coarse sandstone are composed of rounded volcanic fragments (normally andesite) and varicoloured chert. Interbeds of greywacke with a large detrital feldspar content are common.

Argillites are dark grey to black, commonly silty rocks that usually are associated with and grade into carbonaceous limestone and calcareous siltstone beds.

Cherts comprise a minor part of the succession; beds rarely exceed a few feet in thickness and are usually interlayered with argillaceous rocks.

Quartzose sandstones a few feet thick are present at the lowest stratigraphic levels evident.

The upper limit of unit E is placed above a conglomerate-mudstone interval (more than 100 feet thick) which is exposed near the southern limit of the unit. Unfortunately this interval has not as yet been traced to the north with confidence.

CHEMISTRY: Refractive index determinations of fused glass beads have provided a consistent method of distinguishing rock compositions in the map-area. A histogram plot of this data (Fig. 7) is skewed toward the rhyolite-dacite composition fields and illustrates the degree of acid volcanism within the area. Six representative samples were selected for complete silicate analysis (Table 2) and are compared (Table 3) with average chemical compositions of Daly (1930): the Harrison Lake samples have higher Na but lower Ca and K concentrations; Mg is more abundant in the rhyolites but not in the other samples. These chemical differences are also reflected in the normative feldspar calculations (Table 3).

TABLE 2. CHEMICAL AND NORMATIVE MINERAL COMPOSITIONS OF SIX REPRESENTATIVE SAMPLES FROM THE MAP-AREA

(calculated as water free)

	Rhyolite		Dacite		Andesite	Basalt
SiO_2	75.5	75.3	71.0	71.9	63.3	53.7
TiO_2	0.40	0.67	0.40	0.60	1.03	0.80
Al_2O_3	14.22	13.54	15.02	14.33	16.34	18.97
Fe_2O_3	0.93	0.81	1.77	2.18	4.27	1.44
FeO	0.70	2.58	1.90	1.58	2.78	5.99
MnO	0.17	0.20	0.13	0.10	0.16	0.20
MgO	1.38	3.07	2.04	1.35	2.44	6.96
CaO	0.20	0.28	2.96	4.43	2.52	4.22
Na_2O	4.09	4.25	3.75	5.36	6.67	5.04
K_2O	2.93	1.79	0.32	1.13	0.42	1.50
P_2O_5	0.08	0.11	0.07	0.12	0.42	0.13

Normative Mineral Calculations

Quartz	47	44	34	41	----	----
Orthoclase	14	10	2	7	3	9
Albite	30	34	34	49	48	45
Anorthite	1	2	19	7	15	21
Nepheline	----	----	----	----	10	----
Pyroxene	4	9	7	4	8	9
Olivine	----	----	----	----	----	13
Magnetite	½	1	2	2	5	7
Ilmenite	½	1	1	1	2	1
Corundum	4	7	2	1	----	1

The rhyolite samples are closely comparable with the quartz-keratophyre' of Daly (with the exception of Mg which is higher in the rhyolites), but this does not hold for the dacites which have anomalous Ca concentrations. The andesite and basalt do not compare with the 'keratophyre' of Daly (Table 3).

A positive correlation with the calc-alkaline Cascade trend is indicated on the triaxial variation diagram: (Al_2O^3/SiO_2) versus $(FeO + Fe_2O_3 + \frac{1}{2}(MgO + CaO)$ versus $(K_2O + Na_2O)$ (Fig. 8, after Church, 1973).

TABLE 3. AVERAGE CHEMICAL COMPOSITIONS OF SOME VOLCANIC ROCKS AFTER DALY (1933)

	Rhyolite	Quartz-keratophyre	Dacite	Keratophyre	Andesite	Basalt
SiO_2	73.89	75.98	66.68	63.06	60.35	49.87
TiO_2	.33	.17	.58	.46	.78	1.38
Al_2O_3	13.69	13.20	16.50	17.81	17.54	15.96
Fe_2O_3	1.47	1.15	2.41	1.97	3.37	5.47
FeO	.90	.66	1.93	3.43	3.69	6.47
MnO	.08	.29	.06	.01	.22	.32
MgO	.38	.34	1.44	1.29	2.90	6.27
CaO	1.22	.84	3.51	1.11	5.92	9.09
Na_2O	3.43	5.92	4.03	5.36	3.60	3.16
K_2O	4.53	1.27	2.71	5.42	2.40	1.55
P_2O_5	.08	.18	.15	.08	.30	.46

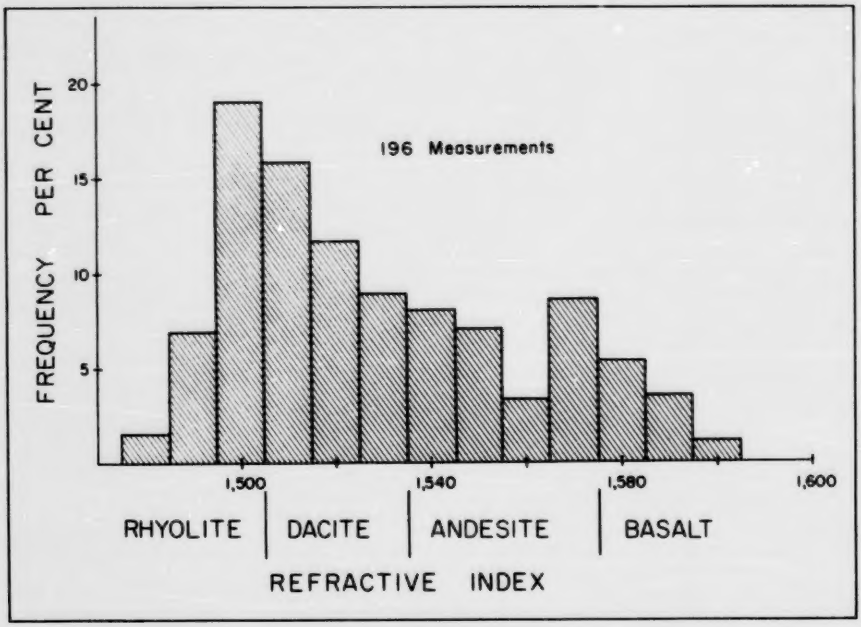


Figure 7. Frequency plot of refractive index determinations on 196 fused volcanic rocks from the Harrison Lake area.

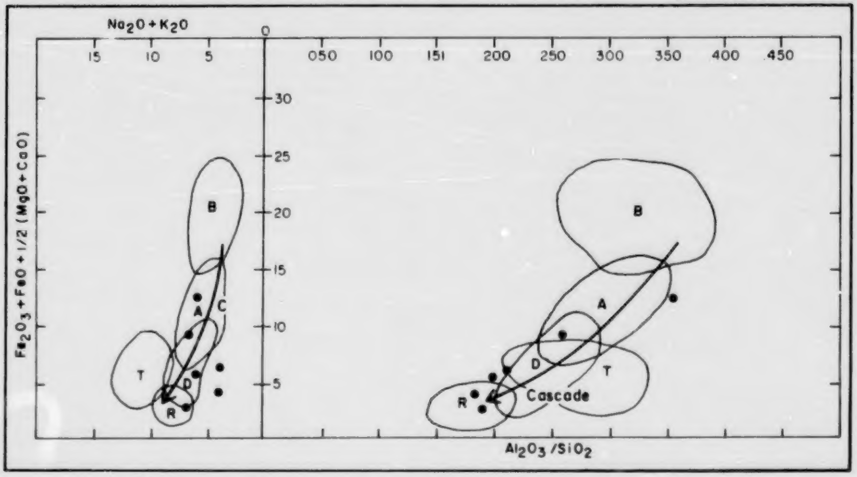


Figure 8. Chemical variation diagram showing the relation of analyses of six volcanic rocks from the Harrison Lake area to the rhyolite-dacite-andesite-basalt trend (after Church, 1973).

STRUCTURE AND METAMORPHISM: Broad open domes are the dominant structural element in the map-area. Each major topographic element (Mount Keenan, Mount Klaudt) appears to be the locus of a domal structure. Axial trends are not obvious except in the southeastern part of the map-area where a broad north-northwesterly trending anticline (an elongate dome) is apparent. The apparent correspondence of prominent topographic elements with macroscopic structures of the area may reflect the location of remnant centres of accumulation.

Structural elements at the mesoscopic scale are not common. Layering in most pyroclastic and flow units is very difficult to establish in outcrop exposures. Minor folds are rare and no penetrative structural fabric (cleavage, schistosity, etc.) has been imposed on the rocks. The lack of penetrative deformation is reflected by the totally undeformed state of fragments of all sizes in the pyroclastic and epiclastic rocks.

The area has undergone little or no regional metamorphism (a thorough search for zeolite minerals has not been made to present). Limited contact metamorphic effects include a biotite hornfels aureole proximal to the granodiorite stock in the southeastern part of the map-area, and a sericite alteration halo near the granitic stock northeast of Mount Klaudt.

GEOLOGIC SETTING OF THE SENECA OCCURRENCES: Geologic setting of the Seneca mineral occurrence, located on the eastern slope of lower Chehalis River (Fig. 6), has many features common to Kuroko-type and Noranda-type deposits. The term 'Kuroko-type' is applied here in its broadest sense to describe: 'stratabound polymetallic mineral deposits genetically related to submarine acid volcanic activity...' (Matsukuma, p. 153). Although stratabound (limited to a particular stratigraphic interval) these deposits are complex in character and may include mineralized transgressive stockwork and vein elements, and irregular lenses and pods of massive mineralization in addition to mineralization with well-defined stratiform characteristics. 'Noranda-type' deposits share many of the same characteristics: sulphide mineralization occurs in close spatial relationship to the last stages of acid volcanism, especially along and adjacent to rhyolite-andesite interfaces and rhyolite-epiclastic sediment interfaces (Dugas, 1966; Gilmour, 1965; Goodwin, 1965).

The Seneca occurrence comprises massive sphalerite-pyrite-chalcopyrite as discontinuous lenses (pods ?) within a thin acid pyroclastic host. The pyroclastic host is, predominantly, a rhyolite lithic tuff and lapilli tuff. Rounded and subrounded rhyolite fragments 'float' in a fine-grained matrix of quartz and feldspar. Associated with the rhyolite tuff are lenses of breccia and lapilli tuff of bleached rhyolite fragments in a fine-grained, black somewhat friable matrix thought to represent lithified carbonaceous mud. Thin bands of laminated argillite and andesite lapilli tuff and breccia are intercalated. Thin rhyolite and andesite flows (Rf and Df) overlie the pyroclastic rocks. This succession, which has an aggregate thickness of approximately 200 feet is bounded above and below by dacite porphyry (unit Df).

Pyrite is ubiquitous throughout the pyroclastic host as fine disseminations, as rims around fragments, and along fractures. The sulphide lenses are intimately associated with the rhyolite lapilli tuff and intercalated argillaceous breccias. Conformity with the host rocks is not clearly evident in the pit exposures; the western limit (downslope) of mineralization appears controlled by a steep fault of unknown magnitude; the eastern limit (upslope) of mineralization is not exposed.

Texturally, the sulphides comprise aggregates (often massive) of anhedral grains of varying size in a siliceous matrix. Lenses of black sphalerite are often rimmed by fine-grained pyrite and chalcopyrite. Fragmental textures are clearly evident in some specimens. Bladed barite crystals also occur with the mineralization (Cominco geologists, personal communication, 1973).

The argillaceous breccias within the host pyroclastic unit appear to be of secondary origin, and may represent a lithified mud slurry sloughed off a volcanic source area in a shallow marine environment; the fragmental nature of some of the sulphides may indicate involvement in this process; however an upslope source for the mineralization has not been established. Mineralized veins and stockworks are not present, and the host rocks have not undergone alteration, placing severe restrictions on possible hydrothermal activity in the area. The association of bladed barite with the sulphides enforces the notion of sulphide deposition in a restrictive shallow marine environment.

The south slope of Mount Keenan is a gently southwestward dipping homocline, and the general stratigraphic relationships described around the Seneca occurrence persist along strike on the east slope of Chehalis River. Poor exposure has hampered extrapolation of rock units, however acid pyroclastic units with similar characteristics are present.

WORK DONE: Surface diamond drilling, eight holes totalling 9,800 feet.

REFERENCES:

B.C. Dept. of Mines & Pet. Res., G.E.M., 1971, p. 265; Church, B. N. (1973), A New Method of Identifying Common Volcanic Rocks and Illustrating their Chemical Composition, in press; Crickmay, C. H. (1925), The geology and paleontology of the Harrison Lake district, British Columbia, together with a general review of the Jurassic faunas and stratigraphy of western North America, *Stanford University Press*, unpublished Ph.D. thesis; Crickmay, C. H. (1962), Gross stratigraphy of Harrison Lake area, British Columbia, *Evelyn de Mille Books*, Calgary (published by author); Dugas, J.

(1966), The Relationship of Mineralization to Precambrian stratigraphy in the Rouyn-Noranda area, Quebec, *Geol. Assn. Can.,* Sp. Paper 3, pp. 43-55; Fisher, R. V. (1961), Proposed Classification of Volcaniclastic Sediments and Rocks, *Geol. Soc. Am.,* Bull., Vol. 72, pp. 1409-1414; Gilmour, P. (1965), The Origin of the Massive Sulphide Mineralization in the Noranda District, Northwestern Quebec, *Geol Assn. Can.,* Proc., Vol. 16, pp. 63-81; Goodwin, A. M. (1965), Mineralized volcanic Complexes in the Porcupine-Kirkland Lake-Noranda Region, Canada, *Ec. Geol.,* Vol. 60, No. 5, pp. 955-971; Matsukuma, T. and Horikoshi, E. (1970), Kuroko Deposits in Japan, *University of Tokyo Press,* Tokyo, pp. 153-179; McTaggart, K. C. (1970), Tectonic History of the Northern Cascade Mountains, *Geol. Assn. Can.,* Sp. Paper No. 6, pp. 137-148; *Minister of Mines, B.C.,* Ann. Rept., 1897, p. 578; 1898, p. 1113; 1962, pp. A47, 93; Misch, P. (1966), Tectonic Evolution of the Northern Cascades of Washington State, *C.I.M.,* Sp. Vol. 8, pp. 101-184; Monger, J.W.H. (1970), Hope Map-Area, West Half, British Columbia, *Geol. Surv., Canada,* Paper 69-47, 75 pp; Pride, K. R. (1973), A Mineralogical Study of Selected Sulphide Samples from the Seneca Property, near Harrison Mills, British Columbia, unpublished B.Sc. thesis, *U.B.C.;* Roddick, J. A. (1965), Vancouver North, Coquitlam, and Pitt Lake Map-Areas, British Columbia, *Geol. Surv., Canada,* Mem. 335; 276 pp.

RR, FE (No. 268, Fig. B)

LOCATION:	Lat. 49° 21′ Long. 121° 57′ (92H/5W) NEW WESTMINSTER M.D. At approximately 3,700 feet elevation on the east side of Chehalis River, 8 miles northeast of Harrison Mills.
CLAIMS:	RR 1 to 8, FE 1 to 6.
ACCESS:	By road from Harrison Mills, 10 miles.
OPERATOR:	COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 5.
DESCRIPTION:	The claims are underlain by acid volcanic rocks and banded tuffs of the Harrison Lake Formation.
WORK DONE:	Geochemical survey, 150 soil and 20 stream silt samples.
REFERENCE:	*B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 266.

JOHN (No. 95, Fig. B)

LOCATION:	Lat. 49° 22.2′ Long. 121° 50.5′ (92H/5W) NEW WESTMINSTER M.D. At Camp Cove on the west side of Harrison Lake, 5 miles northwest of Harrison Hot Springs.
CLAIMS:	JOHN 4, 8 to 20, A 1 to 4, A 5 and 6 Fractions.
ACCESS:	By logging road from Harrison Mills, 10 miles.
OPERATOR:	GREEN LAND MINING LTD., 2050, 777 Hornby Street, Vancouver 1.
DESCRIPTION:	Disseminated pyrite occurs throughout a chaotic succession of pyroclastic and volcanic flow rocks which overlie immature epiclastic sandstone, chert, and calcareous argillite.
WORK DONE:	Geochemical soil sampling during 1971.
REFERENCE:	Assessment Report 3706.

HE (No. 97, Fig. B)

LOCATION: Lat. 49° 26′-28′ Long. 121°58′-122°01′ (92H/5W; 92G/8E)
NEW WESTMINSTER M.D. At elevations of 700 to 4,000 feet on the east side of Chehalis Lake, 15 miles north of Harrison Mills.
CLAIMS: HE 1 to 6, SKIP 1 to 20, 101 to 114.
ACCESS: By logging road from Harrison Mills.
OPERATORS: E. D. DODSON and E. BURNETT, 12, 425 Howe Street, Vancouver 1.
DESCRIPTION: Acid pyroclastic and volcanic flow rocks underlie the property.
WORK DONE: Geochemical survey during 1971; 55 samples collected.
REFERENCE: Assessment Report 3627.

JUMP (No. 98, Fig. B)

LOCATION: Lat. 49° 28.5′-30.5′ Long. 121° 57.5′-60.0′ (92H/5W, 12W)
NEW WESTMINSTER M.D. At elevations of 700 to 4,000 feet on the east side of Chehalis River, northeast of Chehalis Lake, 17 miles north of Harrison Mills.
CLAIMS: JUMP, HOP, SKIP, totalling 60.
ACCESS: By logging road from Harrison Mills, 30 miles.
OWNER: E. D. DODSON, 2990 St. Hilda Avenue, North Vancouver.
DESCRIPTION: Acid pyroclastic and volcanic rocks underlie the area.
WORK DONE: Geochemical survey.
REFERENCE: Assessment Report 3729.

BEA, GIANT, SWEDE (No. 139, Fig. B)

LOCATION: Lat. 49° 25′-29′ Long. 121° 26′-32′ (92H/5E, 6W)
NEW WESTMINSTER M.D. Between 750 and 3,000 feet elevation on the west side of Highway 1, from 2 to 6 miles north of Hope.
CLAIMS: BEA, GIANT, SWEDE, MARY G, PAT, P, totalling 123.
ACCESS: By logging road from Hope, 1 to 6 miles.
OWNER: KELSO EXPLORATIONS LTD., 411, 470 Granville Street, Vancouver 2.
METALS: Nickel, copper.
DESCRIPTION: Chalcopyrite, pyrite, and nickeliferous pyrrhotite occur as disseminations in fractured pyroxenite and peridotite. A nickel saprolite deposit occurs near Schkam Lake.
WORK DONE: Bulldozer trenching and stripping of selected areas on P and Bea claims; prospecting and further outlining of anomalous areas.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 257, 258.

NI (No. 99, Fig. B)

By J. W. Robinson

LOCATION: Lat. 49° 27′-34.8′ Long. 121° 34.5′-45.6′ (92H/5E, 12)
NEW WESTMINSTER M.D. Between 100 and 7,000 feet elevation in the area of Cogburn, Talc, and Settler Creeks, 16 miles north-northeast of Harrison Hot Springs.

CLAIMS: Approximately 530 full size and fractional claims, named NI.

OWNERS: GIANT EXPLORATIONS LIMITED and MASCOT COPPER MINES LIMITED, Box 10010, Pacific Centre, 700 West Georgia Street, Vancouver 1.

METALS: Nickel, copper.

DESCRIPTION: Nickel-copper-bearing ultramafic bodies intrude a diorite intrusive and metasedimentary rocks.

WORK DONE: Detailed exploration carried out on areas No. 4 and No. 7 included geological mapping, geochemical, and magnetometer surveying controlled by two 4.5 line-mile grids. A total of 11 line-miles of electromagnetic surveys was completed in areas No. 4 and No. 7. Several of the anomalies outlined by this work were checked with five short diamond-drill holes with an aggregate length of 1,771 feet. Reconnaissance geological and geochemical surveys were conducted in other areas.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 258-264; Assessment Reports 4070, 4071.

EVE, TAX (No. 252, Fig. B)

LOCATION: Lat. 49° 25′-30′ Long. 121° 12′-18′ (92H/6)
NEW WESTMINSTER M.D. Between 1,200 and 4,500 feet elevation on Coquihalla River, at Dewdney Creek, 11 miles northeast of Hope.

CLAIMS: EVE, TAX, MAK, TOY, N, A, totalling approximatey 100.

ACCESS: By road from Hope, 12 miles.

OWNER: MOUNTAIN PASS MINES LTD., 1930, 1055 West Hastings Street, Vancouver 1.

DESCRIPTION: Ultramafic rocks that cut diorite and sedimentary rocks are exposed.

WORK DONE: Geochemical survey, 137 samples; surface diamond drilling, three holes totalling 500 feet on N 23, 25, and 33 Fraction.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 266.

AUFEAS (No. 253, Fig. B)

LOCATION: Lat. 49° 20.6′ Long. 121° 29.3′ (92H/6W)
NEW WESTMINSTER M.D. Between 750 and 1,500 feet elevation on the west side of Silverhope Creek, 3 miles southwest of Hope.

CLAIMS: PO 1 to 8, PO EXT, CAM 1 to 5, CAM EXT 1 to 3, RAM 1.

ACCESS: By four-wheel-drive vehicle road from the Skagit road, approximately 1 mile.

OWNER: CAMROCK MINES LTD., c/o C. Lee, R.R. 2, Skagit Road, Hope.

METALS: Gold, silver, copper, arsenic.

DESCRIPTION: Fissure veins occur in granodiorite.

WORK DONE: Trenching, 200 feet on PO Ext and Cam Ext 1 and 3.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1915, p. 255; 1939, p. 86; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 250 (CAM, PO, etc.); *Geol. Surv., Canada,* Mem. 139, pp. 148-151.

PRIDE OF EMORY MINE (No. 254, Fig. B)

By J. W. Robinson

LOCATION: Lat. 49° 28.3′ Long. 121° 29.9′ (92H/6W)
NEW WESTMINSTER M.D. At the head of Stulkawhits (Texas) Creek, which flows eastward into the Fraser River, 8 miles north of Hope.

ACCESS: By gravel road about 5 miles long which leads from the Trans-Canada Highway, 8 miles north of Hope, to the mine plant at the 2600 level.

OWNER: GIANT MASCOT MINES LTD., Suite 2410, Toronto-Dominion Bank Tower, Pacific Centre, 700 West Georgia Street, Vancouver 1.

METALS: Nickel, copper (production shown on Table I).

DESCRIPTION: A detailed geological description of this property is contained in the Annual Reports of the British Columbia Minister of Mines and Petroleum Resources for 1964 and 1965 but, in summary, copper, nickel, and iron sulphide mineralization occurs in vertical or steeply inclined pipe-like orebodies within and around an irregularly shaped, ultramafic stock-like body enclosed in diorite.

WORK DONE:

During 1972 important changes were made in the methods of driving development raises, in the stoping method, and in the concentrator. Where conventional staging raises are still being driven, all turns in the raises have been eliminated. Short sublevels are now driven at the elevation at which a turn is required in the raise. A timbered two-compartment raise was used where required. Two large diameter raises (one 60 inches in diameter and one 84 inches in diameter) were bored by a contractor. The vertical blasthole ring-drilling method of stoping has been introduced in stopes at the development stage to replace horizontal blasthole ring drilling. Therefore, the drilling is done from subdrifts rather than from raises. Shorter length longholes are being used for greater control and more footage is being drilling per shift. In the concentrator, one bank of four DR-24 flotation cells was installed in the cleaner circuit. The capacity of the primary ball mill was increased from 1,800 tons per day to 1,900 tons per day by changing the drive-gear ratio.

Development work during the year included 2,596 feet of drifts and crosscuts, 4,357 feet of raises, and 47,513 feet of diamond drilling.

(92H/7)

The 26-175 service raise, a 6-foot by 8-foot raise at 50 degrees, was driven for 550 feet to connect the 2600 level to the 3050 level.

The 26-178 ore pass raise, an 84-inch-diameter vertical raise, was bored by a model 61-R Robbins raise borer for 448 feet from the 2600 level to the 3050 level.

The 26-181 ventilation raise, a 60-inch-diameter vertical raise, was bored by the same raise borer and was completed in July 1972.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 267.

MAE, KERRY (No. 244, Fig. B)

LOCATION: Lat. 49° 15'-18.5' Long. 120° 42.5'-45.5' (92H/7)
SIMILKAMEEN M.D. On both sides of Whipsaw Creek, 9 miles upstream from Highway 3.

CLAIMS: MAE 1 to 21, 25 to 47, KERRY 3 to 24, 37 to 61, 429 to 434, PAT 1 to 24, MIKE 1 and 2.

ACCESS: By road from Highway 3 at Whipsaw Creek bridge, 12 miles.

OWNER: WHIPSAW MINES LTD., 706, 509 Richards Street, Vancouver 1.

METALS: Copper, lead, zinc, gold, silver.

WORK DONE: Detailed geological mapping, trenching, and diamond drilling on four main showings.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 384; Assessment Report 4170.

SILVERTIP (S & M, MARION) (No. 247, Fig. B)

By David Smith

LOCATION: Lat. 49° 16.5' Long. 120° 45' (92H/7)
SIMILKAMEEN M.D. At approximately 5,800 feet elevation near the head of Whipsaw Creek, 16 miles southwest of Princeton.

CLAIMS: SILVERTIP 1 and 2, OK 1 to 8, Mineral Lease M-30 (Lots 172 and 1549 to 1556).

ACCESS: By road from Princeton, 20 miles.

OPERATOR: SILVER TIP EXPLORATIONS LTD., Box 697, Princeton.

METALS: Gold, silver, copper, lead, zinc.

DESCRIPTION: Veins containing galena, sphalerite, chalcopyrite, tetrahedrite, and pyrite occur in chlorite and amphibolite schists.

WORK DONE: Drifting, 200 feet on OK 1; underground diamond drilling, three holes totalling 530 feet on OK 1.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1928, p. 264 (S & M, Marion), *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 272; *Geol. Surv., Canada*, Mem. 243, pp. 102-104.

(92H/7)

WHIP, SAW, PICK (No. 243, Fig. B)

LOCATION: Lat. 49° 17.5′ Long. 120° 45′ (92H/7)
SIMILKAMEEN M.D. At approximately 5,500 feet elevation on the north side of Whipsaw Creek, about 10 miles upstream from Highway 3.

CLAIMS: WHIP 1 to 8, SAW 1 to 8, PICK 1 to 6, AXE 1 to 6.

ACCESS: By road from Princeton, 22 miles.

OWNER: Texasgulf, Inc.

OPERATOR: NEWMONT MINING CORPORATION OF CANADA LIMITED, 1230, 355 Burrard Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: Quartz feldspar porphyry intrudes the Nicola volcanic rocks along their contact with the Eagle granodiorite. Pyrite-chalcopyrite-molybdenite mineralization occurs in the volcanic rocks, and to a lesser extent in the porphyry.

WORK DONE: Trenches mapped; geochemical soil survey, 150 samples; road construction, 1.5 miles on Axe 1-3, 5 and Pick 2; trenching, 2,800 feet on Axe 1-3, 5 and Pick 2 and 6; surface diamond drilling, six holes totalling 3,085 feet on Axe 1-3 and Pick 2.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1968, pp. 212, 213; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 273.

NEV (No. 245, Fig. B)

LOCATION: Lat. 49° 17.2′-18.5′ Long. 120° 36′-39.7′ (92H/7E)
SIMILKAMEEN M.D. Between 3,600 and 5,000 feet elevation on Whipsaw Creek on the north slope of Friday Mountain, 12 miles southwest of Princeton.

CLAIMS: NEV 5 to 44.

ACCESS: By road from Princeton.

OPERATOR: GRANDORA EXPLORATIONS LTD., 107, 325 Howe Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Pyrite and traces of chalcopyrite occur in quartz calcite veins in strongly sheared calcareous schist, limestone, and chlorite schist.

WORK DONE: Geological mapping, 1 inch equals 400 feet; geochemical survey.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 288; Assessment Report 3939.

MONEY (OREGON) (No. 84, Fig. B)

LOCATION: Lat. 49° 18.8′ Long. 120° 31.4′ (92H/7E)
SIMILKAMEEN M.D. On the east bank of Similkameen River, opposite mouth of Friday Creek, 11 miles south of Princeton.

CLAIMS: OREGON (Lot 2265s), MICHIGAN (Lot 2285s), PEARCE No. 4 Fraction (Lot 2631s), PEARCE No. 3 (Lot 2579s), SILVER No. 1

(92H/7E)

Fraction (Lot 2576s), BENARD (Lot 2207s), GREY ROCK (Lot 2051s), HP Fraction (Lot 2575s), LEMON No. 7 (Lot 2008s), UPSILON Fraction (Lot 2013s), TESSIE (Lot 2009s), LEMON No. 9 (Lot 2011s), FRASER No. 1 Fraction (Lot 2929s), BLACK BIRD (Lot 2272s).

ACCESS: By Highway 3 from Princeton.

OWNER: KING-BELL RESOURCES Ltd., 1065 – 16th Avenue, West Vancouver.

WORK DONE: Geochemical survey, 145 samples.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 288; Assessment Reports 2651, 3796.

T (No. 262, Fig. B)

LOCATION: Lat. 49° 19.5' Long. 120° 36.5' (92H/7E)
SIMILKAMEEN M.D. At 3,800 feet elevation 2 miles southwest of Kennedy Mountain, on the southeast side of Whipsaw Creek.

CLAIMS: T 1 to 22.

ACCESS: By road from Princeton, 10 miles.

OWNER: ANCHOR MINES LTD., 807, 409 Granville Street, Vancouver 2.

METAL: Copper.

WORK DONE: Geochemical survey, 13.4 line-miles.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 271; Assessment Report 4171.

SIMILKAMEEN MINE (INGERBELLE) (No. 266, Fig. B)

By David Smith

LOCATION: Lat. 49° 20.2' Long. 120° 33.3' (92H/7E)
SIMILKAMEEN M.D. On Highway 3, 13 miles south of Princeton.

CLAIMS: Eighty-eight Crown-granted claims including INGERSOLL BELLE, INVINCIBLE, LELA, RED BUCK, Mineral Leases M-64 and M-96 to M-99, and 126 recorded claims including AF, RAY, MCB, DEER, NUT, RAD, SER, and BETH.

ACCESS: By Highway 3.

OWNER: SIMILKAMEEN MINING COMPANY LIMITED, Box 520, Princeton.

METAL: Copper (production shown on Table I).

WORK DONE: In 1972, 21,400,000 tons of material was removed from the pit. Milling commenced in March and following tune-up the rated tonnage of 15,000 tons per day has been reached and surpassed. Cycloning of tailings commenced and build-up of starter dams followed; water is recycled.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 385; 1971, p. 270.

FGP (No. 246, Fig. B)

LOCATION: Lat. 49° 21.5′ Long. 120° 37′ (92H/7E)
SIMILKAMEEN M.D. At the junctions of Lamont and Coral Creeks with Whipsaw Creek, approximately 8 miles southwest of Princeton.

CLAIMS: FGP 21 to 50.

ACCESS: By logging road from Princeton, 8 miles.

OWNER: Charta Mines Ltd.

OPERATOR: KELMOUNT EXPLORATIONS LTD., 230, 890 West Pender Street, Vancouver 1.

DESCRPITON: The property is underlain principally by Middle Eocene Princeton Group volcanic and sedimentary rocks. A narrow section of Triassic Nicola volcanic rocks covers approximately one-half of FGP 31, 32, 49 and 50.

WORK DONE: Surface geological mapping, 1 inch equals 3,000 feet covering all claims; geochemical survey, 20 line-miles.

WHIP (No. 83, Fig. B)

LOCATION: Lat. 49° 22.4′ Long. 120° 32.5′ (92H/7E)
SIMILKAMEEN M.D. At approximately 3,000 feet elevation on the east side of the Similkameen River, 6 miles south-southwest of Princeton.

CLAIMS: WHIP 1, 2, 4, 12, 13, 15 to 30, WHIP 11 Fraction, PT 1, 3, and 5 Fractions.

ACCESS: By road from Princeton, 11 miles.

OPERATOR: NEWMONT MINING CORPORATION OF CANADA LIMITED, 1230, 355 Burrard Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Disseminations of chalcopyrite-pyrite occur in diorite and monzonite.

WORK DONE: Surface workings mapped; surface geological mapping, 1 inch equals 400 feet covering Whip 17 to 22; magnetometer survey, 4 line-miles; geochemical soil survey, 63 samples covering Whip 21 and 22; road construction, 0.4 mile on Whip 15; trenching, 2,200 feet on Whip 15; surface diamond drilling, two holes totalling 1,112 feet on Whip 15.

REFERENCE: Assessment Report 3523.

DON (No. 82, Fig. B)

LOCATION: Lat. 49° 25′-26.5′ Long. 120° 38′-41′ (92H/7E)
SIMILKAMEEN M.D. On Bromley Creek, 7 miles west-southwest of Princeton.

CLAIMS: DON 1 to 36.

ACCESS: By Highway 3 from Princeton.

OWNER: DARKHAWK MINES LTD., 409 Granville Street, Vancouver 1.

WORK DONE: Electromagnetic survey, 12 line-miles.

REFERENCE: Assessment Report 3596.

NIGHTHAWK (No. 118, Fig. B)

LOCATION: Lat. 49° 29′ Long. 120° 38′ (92H/7E)
SIMILKAMEEN M.D. At approximately 2,500 feet elevation in Tulameen Canyon, 6 miles west-northwest of Princeton.

CLAIMS: NIGHTHAWK 1 to 10, NIGHTHAWK 11 and 12 Fractions, VULTURE 1 and 2, VULTURE 9 Fraction, MAGPIE 1 to 8, MAGPIE 9 to 12 Fractions, ALBATROSS 1 and 2.

ACCESS: By the Coalmont road from Princeton, 10 miles.

OWNER: Texasgulf, Inc.

OPERATOR: ECSTALL MINING LIMITED, 701, 1281 West Georgia Street, Vancouver 5.

METALS: Copper, molybdenum.

DESCRIPTION: Weak copper mineralization occurs on fractures in granodiorite and intruded Nicola volcanic rocks. Pyrite mineralization is widespread.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Nighthawk 1-12 and Magpie 5-8; geochemical survey, 496 soil samples and 56 rock chip samples covering same claims; percussion drilling, four holes totalling 585 feet on Nighthawk 6, 8, and 10.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 272 (Tulameen); Assessment Report 3905.

BBT (No. 79, Fig. B)

LOCATION: Lat. 49° 30.0′ Long. 120° 33.5′ (92H/7E, 10E)
SIMILKAMEEN M.D. On the north side of Asp Creek, 3 miles northwest of Princeton.

CLAIMS: BBT 1 to 24.

ACCESS: By Highway 5 and logging road from Princeton.

OWNER: SUNEX INTERNATIONAL RESOURCES LTD., 615, 850 West Hastings Street, Vancouver 1.

WORK DONE: Line-cutting.

REFERENCE: Assessment Report 3578.

SHIRLEY (No. 78, Fig. B)

LOCATION: Lat. 49° 30.0′ Long. 120° 38.3′ (92H/7E, 10E)
SIMILKAMEEN M.D. Approximately 7 miles west-northwest of Princeton, immediately north of the Tulameen River.

CLAIMS: SHIRLEY 1 to 6.

ACCESS: By all-weather gravel road from Princeton.

OPERATOR: TEXASGULF, INC., 701, 1281 West Georgia Street, Vancouver 5.

DESCRIPTION: The claims are underlain by andesitic tuffs of the Nicola Group.

WORK DONE: Geological mapping, 1 inch equals 400 feet; geochemical survey, 111 samples.

REFERENCE: Assessment Report 3636.

ILSE, SOB (No. 85, Fig. B)

LOCATION: Lat. 49° 16′ Long. 120° 28′ (92H/8W)
SIMILKAMEEN M.D. East of the mouth of Sunday Creek, 4 miles east of the Similkameen River, 13 miles south of Princeton.
CLAIMS: ILSE 1 to 12, SOB 1 to 8.
OWNER: AURUS MINING LTD., 845 Hornby Street, Vancouver 1.
WORK DONE: Line-cutting.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 386; 1971, p. 274; Assessment Report 3726.

DENISE (No. 91, Fig. B)

LOCATION: Lat. 49° 23.7′ Long. 120° 25′ (92H/8W)
SIMILKAMEEN M.D. South of Lorne Lake and east of Willis Creek, 6 miles southeast of Princeton.
CLAIMS: DENISE 1 to 21.
ACCESS: By dirt road from the Allison turnoff on the Princeton-Hedley Highway.
OWNER: GEO-DYNE RESOURCES LTD., 900, 850 West Hastings Street, Vancouver 1.
WORK DONE: Geochemical survey covering Denise 1-8 and 10-15.
REFERENCE: Assessment Report 3903.

A, B (No. 81, Fig. B)

LOCATION: Lat. 49° 26′-27.3′ Long. 120° 22′-25.5′ (92H/8W)
SIMILKAMEEN M.D. On the south shore of the Similkameen River, 1 mile north of Mount Darcy, 5 miles east of Princeton.
CLAIMS: A, B, D, E, H, IKE, totalling 80.
ACCESS: By Highway 3 from Princeton.
OWNERS: Dynasty Explorations Ltd. and Arcan Mining & Smelting Ltd.
OPERATOR: DYNASTY EXPLORATIONS LTD., 330, 355 Burrard Street, Vancouver 1.
WORK DONE: Line-cutting and geochemical survey.
REFERENCES: Assessment Reports 3676, 3902.

OWL, STAR, BOB (No. 248, Fig. B)

LOCATION: Lat. 49° 28′-31.4′ Long. 120° 15′-17.7′ (92H/8W, 9W)
SIMILKAMEEN M.D. North and west of Steven Creek, 11 miles east of Princeton.
CLAIMS: OWL 1 to 12, 15 to 30, STAR 1 to 26, BOB 1 to 10, FLY 1 to 12.
ACCESS: By a logging road which runs north from an old highway on the north side of the Similkameen River about 6 miles east of Princeton.
OWNER: COYNEX DEVELOPMENT LTD., 605, 509 Richards Street, Vancouver 2.

(92H/8E)

METALS: Silver, lead, zinc.

DESCRIPTION: The southern part of the claims is underlain by Coast Range intrusive rocks of grey, coarse-grained, siliceous granite and granodiorite. The greater part of the claims is underlain by Nicola Group green and grey andesites, tuffs, and argillites.

WORK DONE: Geological, geochemical, and magnetometer surveys.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 387; Assessment Report 4080.

MISSION (No. 90, Fig. B)

LOCATION: Lat. 49° 19.6' Long. 120° 05.6' (92H/8E)
OSOYOOS M.D. At 4,300 feet elevation on the west side of Jameson Creek, 3 miles southwest of Hedley.

CLAIMS: FLINT 1 to 6, ROCK 1 to 4, STONE 1 to 6, NEWT 1 to 8, HANH 1 to 4.

ACCESS: By highway and logging road from Hedley, 19 miles.

OWNER: AUSTRO-CAN EXPLORATIONS LTD., 2050, 777 Hornby Street, Vancouver 1.

METALS: Zinc, gold.

DESCRIPTION: Mineralization occurs in shear zones in granodiorite.

WORK DONE: Electromagnetic survey, 7 line-miles and geochemical soil survey, 238 samples covering Flint 1-4.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1936, p. D11; *Geol. Surv., Canada*, Mem. 243, p. 78; Assessment Report 3904.

ILE (No. 119, Fig. B)

LOCATION: Lat. 49° 22' Long. 120° 13' (92H/8E)
SIMILKAMEEN M.D. At approximately 4,200 feet elevation on Smith Creek, 2 miles upstream from the Similkameen River.

CLAIMS: ILE 1 to 10, VENT 1 to 12, PINE 1 to 3, ILE 1 and 2 Fractions.

ACCESS: By four-wheel-drive vehicle road from Highway 3, approximately 3 miles.

OWNER: KARIBA MINES LTD., c/o D. Scott, 102, 1765 Duchess Avenue, West Vancouver.

METALS: Copper, zinc.

DESCRIPTION: Metasedimentary rocks and andesitic lavas of the Nicola Group are intruded by a body of monzonite (or syenite). The rocks have been strongly pyritized and some chalcopyrite and sphalerite mineralization also occurs. A new chalcopyrite showing was found on Pine 2 and 3.

WORK DONE: Road construction, 1.75 miles on Ile 2, 4, 6 and Vent 2 and 4; trenching on Pine 2 and 3; surface diamond drilling, four holes totalling 1,475 feet on Ile 2, 4, and 6.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 273, 274.

HED (No. 92, Fig. B)

LOCATION: Lat. 49° 30'-33' Long. 119°59'-120°03' (92H/9E; 82E/12W)
OSOYOOS M.D. At approximately 6,000 feet elevation at the head of Hedley Creek, 11 miles east-northeast of Hedley.
CLAIMS: HED, CHUM Fraction, TOT Fraction, totalling 126.
ACCESS: By road from Summerland, 20 miles.
OWNERS: Anaconda American Brass Limited and Canex Placer Limited.
OPERATOR: CANEX PLACER LIMITED, 800, 1030 West Georgia Street, Vancouver 5.
METALS: Copper, molybdenum.
DESCRIPTION: Mineralized shear zones occur in biotite and hornblende granodiorites.
WORK DONE: Induced polarization survey, 13.81 line-miles; percussion drilling, six holes totalling 1,365 feet on Hed 52, 53, and 54.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 276; Assessment Report 3914.

HEMATITE, FK (No. 93, Fig. B)

LOCATION: Lat. 49° 36.3' Long. 120° 21.5' (92H/9W)
SIMILKAMEEN M.D. At elevations of 2,700 to 5,500 feet along Hayes and Finnegan Creeks, 14 miles northeast of Princeton.
CLAIMS: FK 1 to 100.
ACCESS: By secondary road from Princeton, 14 miles.
OPERATOR: BREWSTER LAKE MINES LTD., 101, 325 Howe Street, Vancouver 1.
METALS: Copper, iron, gold, silver, lead, zinc.
DESCRIPTION: Malachite and specular hematite occur in two showings in a fault zone in granitic rocks. Gold, silver, lead, and zinc were reported to occur in the Hematite showing (*see* Ann. Rept., 1928, p. 263).
WORK DONE: Geological photointerpretation covering all claims and geological mapping covering FK 1-14, 49-54, and 71-84 during 1971.
REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1928, p. 263; Assessment Report 3450.

LORRY, SP (No. 120, Fig. B)

LOCATION: Lat. 49° 41.5'-44' Long. 120° 23.5'-25.5' (92H/9W)
SIMILKAMEEN M.D. At approximately 4,800 feet elevation at the head of Spukunne Creek, 18 miles east-northeast of Princeton.
CLAIMS: LORRY 1 to 40, SP 1 to 20, SP 1 to 7 Fractions.
ACCESS: By helicopter from Princeton, 20 miles.
OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.
METAL: Copper.
DESCRIPTION: This property covers part of the contact between volcanic rocks of the Nicola Group and medium-grained porphyritic granodiorite. Near the

contact epidote and garnet are found in the volcanic rocks. Minor amounts of pyrite, chalcopyrite, and pyrrhotite occur as disseminations and fill fractures in the volcanic rocks.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet covering Lorry 1-40; magnetometer survey, 13.4 line-miles covering Lorry 1-8, 9, 11, 13, 15, 17-32, SP 1-20, and SP 1-7 Fractions; geochemical soil survey, 294 samples covering same claims as magnetometer survey.

SWAN, RAM (No. 239, Fig. B)

LOCATION: Lat. 49° 37.5'-41.5' Long. 120° 26.5'-29' (92H/9W)
SIMILKAMEEN M.D. On Rampart and Swanson Creeks, 14 miles east-northeast of Princeton.

CLAIMS: SWAN 1 to 48, RAM 1 to 48, SEAN 1 to 9, 13, 15 to 29, 32 to 42, 44 to 47.

ACCESS: By road from Princeton.

OWNER: TYEE LAKE RESOURCES LTD., 1930, 1055 West Hastings Street, Vancouver 1.

WORK DONE: Surface geological mapping; magnetometer survey; geochemical soil survey.

BECKI (No. 121, Fig. B)

LOCATION: Lat. 49° 44' Long. 120° 26.5'-29.5' (92H/9W)
SIMILKAMEEN M.D. At approximately 4,700 feet elevation 2 miles southeast of Missezula Lake, 20 miles north of Princeton.

CLAIMS: BECKI 1 to 40.

ACCESS: By road from Princeton, 20 miles.

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.

DESCRIPTION: The rocks underlying the property are part of the Nicola Group. A small amount of malachite was found in volcanic breccia. Most of the property is underlain by andesite.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet covering Becki 1 to 24; geochemical soil survey, 277 samples covering same claims.

SNOW (No. 122, Fig. B)

LOCATION: Lat. 49° 37' Long. 120° 29' (92H/9W, 10E)
SIMILKAMEEN M.D. At approximately 4,500 feet elevation at the confluence of Summers and Rampart Creeks, 10 miles north of Princeton.

CLAIMS: SNOW 1 to 6, PAT 1 to 18, TED 1 to 4, DIG 1 to 7, KEN 4 and 5 Fractions, DIG 1 Fraction, B 1 to 11 Fractions.

ACCESS: By the Merritt-Princeton Highway from Princeton, 10 miles.

OWNER: Coynex Development Ltd.

(92H/9W, 10E)

OPERATOR: ISO EXPLORATIONS LTD., 700, 1177 West Hastings Street, Vancouver 1.

METALS: Copper, lead, zinc, silver.

DESCRIPTION: The area is underlain by Nicola Group volcanic and sedimentary rocks intruded by igneous rocks of Jurassic age. Mineralization consisting of pyrite and copper minerals occurs in the contact zones.

WORK DONE: Surface geological mapping, 1 inch equals 100 feet covering Snow 1 and 3, Pat 1, 2, 17, and 18, and Ted 1 and 2; self-potential survey, 5 line-miles covering same claims; geochemical soil survey, 500 samples covering Snow, Pat, and Ken claims; road construction, 3 miles; trenching, 1,400 feet on Snow 1 and 3, Pat 1, 2, 17, and 18 and Ted 1 and 2; surface diamond drilling, three holes totalling 876 feet on Snow 1 and 3.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 279.

PIP, OK (No. 123, Fig. B)

LOCATION: Lat. 49° 37'-39' Long. 120° 28.5'-31' (92H/9W, 10E)
SIMILKAMEEN M.D. At elevations of 3,000 to 3,500 feet between summers and Rampart Creeks, 12 miles north of Princeton.

CLAIMS: PIP 1 to 18, OK 19 to 32, 37 to 48.

ACCESS: By road from Princeton, 14 miles.

OWNER: Kalco Valley Mines Ltd.

OPERATOR: ISO EXPLORATIONS LTD., 700, 1177 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Triassic volcanic rocks of the Nicola Group are intruded by Jurassic granodiorite.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; induced polarization survey, 20 line-miles; geochemical soil survey, 1,056 samples; trenching, 2,000 feet on Pip 5 and OK 21-24; percussion drilling, 20 holes totalling 3,436 feet on Pip 4-10, 12 and OK 26.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 279; Assessment Report 4166.

EJ (No. 124, Fig. B)

LOCATION: Lat. 49° 40.5'-44' Long. 120° 29'-31' (92H/9W, 10E)
SIMILKAMEEN M.D. At approximately 3,100 feet elevation near Summers Creek.

CLAIMS: EJ 1 to 75 (EJ 1 to 28 are, in part, a restaking of BO 1 to 24).

ACCESS: By Summers Creek road from Princeton, 15 miles.

OPERATOR: VARGAS MINES LTD., 1155, 555 Burrard Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The property is underlain by fractured volcanic rocks of the Nicola Group near the Summers Creek fault.

WORK DONE: Claims surveyed.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 281 (BO).

NELLIE (SHAMROCK) (No. 127, Fig. B)

LOCATION: Lat. 49° 45' Long. 120° 30' (92H/9W, 10E, 15E, 16W) SIMILKAMEEN M.D. The property is centred 1 mile south of the south end of Missezula Lake.

CLAIMS: NELLIE 1 to 31, WARM 1 to 8 (previously ESTHER, LEM and SHAMROCK).

ACCESS: By Highway 4 and dirt road along Summers Creek from Princeton, 21 miles.

OWNER: Belcarra Explorations Ltd.

OPERATORS: BELCARRA EXPLORATIONS LTD., 420, 475 Howe Street, Vancouver 1 and RIO TINTO CANADIAN EXPLORATION LIMITED, 615, 555 Burrard Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Chalcocite, malachite, and chalcopyrite occur in sheared and fractured volcanic rocks.

WORK DONE: Belcarra Explorations Ltd. – claims surveyed; surface geological mapping, 1 inch equals 200 feet covering all claims; ground magnetometer survey, 25 line-miles; induced polarization survey, 12 line-miles; geochemical soil and silt survey, approximately 1,000 samples; trenching, 1,300 feet; Rio Tinto Canadian Exploration Limited – surface geological mapping, 1 inch equals 400 feet covering Nellie 4, 6, 9-11, 13, 21, 28, and 29; induced polarization and magnetometer surveys, 12.7 line-miles covering Nellie and Warm claims; geochemical survey, 690 samples covering Warm 1-8.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 278 (Esther, Lem); Assessment Reports 3955, 4169.

PRIMER (OD, OB, OC) (No. 126, Fig. B)

LOCATION: Lat. 49° 44'-47.5' Long. 120° 26.5'-30' (92H/9W, 16W) SIMILKAMEEN M.D. From 1 to 2 miles east and southeast of Missezula Lake.

CLAIMS: OD 1 to 8, 17 to 20, OB 1 to 40, OC 1 to 40, BILL 1 to 10 (formerly staked as KING GEORGE and PRIMER).

ACCESS: By Highway 4 and dirt road along Summers Creek from Princeton, 21 miles.

OWNER: Primer Group Minerals Ltd.

OPERATOR: RIO TINTO CANADIAN EXPLORATION LIMITED, 615, 555 Burrard Street, Vancouver 1.

METAL: Copper.

WORK DONE: Magnetometer and induced polarization surveys.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1963, p. 57; 1965, p. 157; 1966, p. 176; 1968, p. 204; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 279; 1971, p. 277; *Geol. Surv., Canada,* Mem. 243, p. 92; Assessment Reports 493, 2354, 2355, 2356, 4169.

LP, LB (No. 76, Fig. B)

LOCATION: Lat. 49° 32.8′-35.5′ Long. 120° 36′-38.5′ (92H/10E)
SIMILKAMEEN M.D. At elevations between 4,000 and 5,000 feet near the headwaters of Asp Creek, 9 miles northwest of Princeton.

CLAIMS: LP 1 to 24, LB 1 to 6, LJ 1 to 4, LR 3 to 18.

ACCESS: By Highway 5 and secondary road from Princeton.

OWNER: AVALANCHE INDUSTRIES LTD., 24, 448 Seymour Street, Vancouver 2.

DESCRIPTION: The property is underlain mainly by volcanic and/or sedimentary rocks belonging to the Nicola Group.

WORK DONE: Magnetometer survey, 24 line-miles.

REFERENCE: Assessment Report 3599.

CU, RL (No. 77, Fig. B)

LOCATION: Lat. 49° 34.5′-36.0′ Long. 120° 34.3′-36.7′ (92H/10E)
SIMILKAMEEN M.D. On the west side of Allison Creek, approximately 10 miles north-northwest of Princeton.

CLAIMS: CU 5 to 8, 11 to 16, RL 33 to 43, 49 to 60.

ACCESS: By road from Princeton, approximately 12 miles.

OWNER: NORTHAIR MINES LTD., 333, 885 Dunsmuir Street, Vancouver 1.

DESCRIPTION: The east half of the property is underlain by Upper Triassic Nicola volcanic and sedimentary rocks. The west half is mainly underlain by quartz diorite.

WORK DONE: Magnetometer survey, 35 line-miles covering CU 5-8, 11-16 and RL 33-44, 49-55.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, pp. 281, 282; Assessment Report 3759.

FAN (No. 242, Fig. B)

LOCATION: Lat. 49° 37′-39′ Long. 120° 33′-35′ (92H/10E)
SIMILKAMEEN M.D. One mile northeast of Laird Lake, 13 miles north-northwest of Princeton.

CLAIMS: FAN 1 to 6, 29 to 42, 49 to 56.

ACCESS: By dirt road, 1 mile east from Highway 5.

OWNER: JAY BUTTERWORTH, 4727 Wesley Drive, Delta.

WORK DONE: Reconnaissance magnetometer survey, 15.6 line-miles.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 389 (ON), Assessment Reports 2542, 4084.

SUN (No. 74, Fig. B)

LOCATION: Lat. 49° 38.0′ Long. 120° 36.7′ (92H/10E)
SIMILKAMEEN M.D. At the south end of Dry Lake, 12 miles north-northwest of Princeton.

(92H/10E)

CLAIMS: SUN 1 to 4.

ACCESS: By Highway 5 from Princeton.

OPERATOR: COSEKA RESOURCES LIMITED (formerly Coin Canyon Mines Ltd.), 2130, 1055 West Hastings Street, Vancouver 1.

WORK DONE: Line-cutting during 1971.

REFERENCE: Assessment Report 3606.

FAN, ANITA (No. 128, Fig. B)

LOCATION: Lat. 49° 39.5′ Long. 120° 34.5′ (92H/10E)
SIMILKAMEEN M.D. Between 4,000 and 4,800 feet elevation 2 miles north of Laird Lake, 14 miles north-northwest of Princeton.

CLAIMS: FAN 25 to 28, 43 to 48, ANITA 3 to 10, JE 7, 9, 11, 12, 14, LEN 1.

ACCESS: By dirt road from Highway 5, 4 to 5 miles.

OWNERS: Jay Butterworth and Equatorial Resources Limited.

OPERATOR: EQUATORIAL RESOURCES LIMITED, 1019, 409 Granville Street, Vancouver 2.

METAL: Copper.

DESCRIPTION: Varicoloured lavas, argillites, tuffs, and limestones of the Nicola Group of Triassic age predominate in the general area. These are locally intruded and bounded to the east and west of the property by the intrusive rocks of Jurassic age. The Princeton Group of sedimentary rocks of Middle Eocene age outcrop to the south.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; magnetometer survey, 20 line-miles; geochemical survey, 1,000 samples.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 389 (ON); Assessment Reports 2542, 4083.

J, P (No. 141, Fig. B)

LOCATION: Lat. 49° 39.5′-40.5′ Long. 120° 35′-37′ (92H/10E)
SIMILKAMEEN M.D. Straddling Highway 5, 1 mile south of Allison Lake.

CLAIMS: J 1 to 14, P 1 to 14.

ACCESS: By Highway 5.

OPERATOR: NORTHWIND MINES LTD., 230, 890 West Pender Street, Vancouver 1.

METAL: Copper.

WORK DONE: A geochemical survey over 28 line-miles and reconnaissance geological survey.

REFERENCE: Assessment Report 4168.

LISA, AD (No. 72, Fig. B)

LOCATION: Lat. 49° 42.5′-44.5′ Long. 120° 37.5′-40.5′ (92H/10E)
SIMILKAMEEN M.D. At elevations of 3,700 to 4,700 feet between Kump Lake and Mount Pike, 3 miles northwest of Allison Lake.

(92H/10E)

CLAIMS: LISA 1 to 20, 26 to 45, AD 1 to 22.
ACCESS: By Highway 5 and logging road.
OPERATOR: MONTEGO RESOURCES LTD., 107, 325 Howe Street, Vancouver 1.
WORK DONE: Line-cutting, 48 line-miles and magnetometer survey.
REFERENCE: Assessment Report 3712.

SOUTH MDA (No. 238, Fig. B)

LOCATION: Lat. 49° 43.5' Long. 120° 32' (92H/10E)
SIMILKAMEEN M.D. At approximately 4,400 feet elevation on the west side of Summers Creek, 3 miles south-southwest of Missezula Lake.
CLAIMS: MDA 201 to 209, 215, RCS 1 to 4, 6 to 23, 1 Fraction.
ACCESS: By Highway 5 from Princeton, 21 miles.
OWNER: SHEBA COPPER MINES LIMITED, 703, 535 Thurlow Street, Vancouver 5.
DESCRIPTION: The claims are underlain by Nicola Group volcanic rocks and granitic rocks of the Coast Intrusions. Several small dyke-like diorite intrusions cut Nicola Group rocks.
WORK DONE: Claims surveyed; magnetometer survey, 4 line-miles covering MDA 201-209, 215, RSC 3, 4, 6-10, 19-23, and RCS 1 Fraction; geochemical soil survey, 883 samples covering same claims as for magnetometer survey.

DEB (No. 73, Fig. B)

LOCATION: Lat. 49° 44' Long. 120° 37.5' (92H/10E)
SIMILKAMEEN M.D. On the Merritt-Princeton Highway, about 2.5 miles north of Allison Lake.
CLAIMS: DEB 1 to 12.
ACCESS: By Highway 5 from Allison Lake, 2.5 miles.
OWNER: SOLOMON DEVELOPMENT LTD., 934, 850 West Hastings Street, Vancouver 1.
WORK DONE: Electromagnetic survey covering Deb 1-8.
REFERENCE: Assessment Report 3579.

D, R (No. 129, Fig. B)

LOCATION: Lat. 49° 31.8' Long. 120° 53.5' (92H/10W)
SIMILKAMEEN M.D. At approximately 2,800 feet elevation at the junction of the Tulameen River and Britton (Eagle) Creek.
CLAIMS: D 1 to 3, R 1 to 3.
ACCESS: By road from Tulameen, 10 miles.
OWNERS: R. STEINER and W. PARKER (known as P&S Group), 371 – 56th Street, Delta.
METALS: Asbestos, iron, chromium, platinum, copper.
WORK DONE: Road construction, 1 mile; trenching and hydraulic stripping.
REFERENCES: *Geol. Surv., Canada*, Mem. 26, p. 160; Mem. 243, pp. 101, 102.

LIVERPOOL (LAW'S CAMP) (No. 130, Fig. B)

LOCATION: Lat. 49° 34.0' Long. 120° 54.2' (92H/10W)
SIMILKAMEEN M.D. At approximately 4,000 feet elevation surrounding and to the northeast of Murphy Lakes, on the west side of Lawless Creek.

CLAIMS: LIVERPOOL (Lot 1188), VIC 1 to 18, VIC 19 Fraction, V 1 and 3.

ACCESS: By the Lawless Creek road from Tulameen, 12 miles west.

OWNER: VICTOR MINING CORPORATION LTD., 818, 510 West Hastings Street, Vancouver 2.

METALS: Copper, (gold, silver).

DESCRIPTION: Interbedded limestones and chloritic and talcose schists of the Nicola Group have been intruded by granodiorite and porphyry dykes of the Coast Plutonic Complex.

WORK DONE: Geochemical survey, 106 samples; trenching, 1,500 feet on Liverpool, Vic 2, and Vic 19 Fraction.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1960, pp. 42-55; *Geol. Surv., Canada,* Mem. 243, p. 98.

COLDWATER (KEYSTONE) (No. 255, Fig. B)

LOCATION: Lat. 49° 41.4' Long. 121° 01.4' (92H/11E)
NICOLA M.D. Between 3,400 and 7,000 feet elevation on Coldwater River, 3.5 miles north of Coquihalla.

CLAIMS: LUCKY, HDD, TAB, RIP, JULIE, HOPE, totalling approximately 36.

ACCESS: By gravel road from Hope, 33 miles or by gravel road from Merritt, 40 miles.

OWNER: CORVAL RESOURCES LTD., 420, 475 Howe Street, Vancouver 1.

METALS: Zinc, silver, lead, copper, minor gold and cadmium.

DESCRIPTION: Pyrite, galena, sphalerite, tetrahedrite, and chalcopyrite occur in veins and altered quartz monzonite along the contact between the Eagle granodiorite and altered metasedimentary rocks of the Nicola Group.

WORK DONE: Underground mapping, 1 inch equals 20 feet; induced polarization survey, 6 line-miles and magnetometer survey, 8.4 line-miles covering Tab 1, 2, Rip 1-3, Hope 5, 6, HDD 2-6, Rip 24, 26, 28, 67, 69, 75, 77, 80-84.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 284; *Minister of Mines, B.C.,* Ann. Rept., 1936, p. D31; 1954, p. 113; Assessment Reports 4173, 4174.

JM (No. 142, Fig. B)

LOCATION: Lat. 49° 43.8' Long. 121° 04.0' (92H/11E)
NICOLA M.D. Between 4,000 and 4,500 feet elevation on Juliet Creek, 7 miles north-northwest of Coquihalla Lake.

CLAIMS: SEC 1 to 16, BO 1 to 10.

ACCESS: By road from Merritt, 30 miles.

(92H/11W)
OPERATOR: EAGLE BAY MINES LTD., 9th Floor, 850 West Hastings Street, Vancouver 1.
METALS: Copper, molybdenum.
DESCRIPTION: Copper and molybdenum sulphides occur within a porphyritic phase of the Eagle granodiorite.
WORK DONE: Trenching, 800 feet on Sec 5 and 14.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 373 (JM); Assessment Report 2610.

DC NICKEL (No. 101, Fig. B)

LOCATION: Lat. 49° 31.5′-33′ Long. 121° 28′-30′ (92H/11W)
NEW WESTMINSTER M.D. South side of Gordon Creek, 2 miles west of the Fraser River, approximately 10 miles north of Hope.
CLAIMS: DC NICKEL 1 to 8, GORDON 5 to 37.
ACCESS: By Highway 1 and secondary road from Hope.
OWNER: DALTON RESOURCES LTD., 4075 Union Street, Burnaby.
WORK DONE: Line-cutting during 1971.
REFERENCE: Assessment Report 3756.

VICTOR (No. 102, Fig. B)

LOCATION: Lat. 49° 33.5′ Long. 121° 28.2′ (92H/11W)
NEW WESTMINSTER M.D. Between elevations of 2,400 and 3,600 feet 2 miles west-southwest of Yale.
CLAIMS: VICTOR 1 to 24.
ACCESS: By logging road from Yale.
OPERATOR: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.
METALS: Nickel, copper.
DESCRIPTION: Pyrrhotite and chalcopyrite are disseminated in a dyke-like body of gabbro cutting migmatites and metamorphosed quartz diorites.
WORK DONE: Geological, magnetometer, and geochemical surveys covering Victor 1-6.
REFERENCE: Assessment Report 3492.

PIPE (No. 103, Fig. B)

LOCATION: Lat. 49° 36.5′ Long. 121° 28′ (92H/11W)
NEW WESTMINSTER M.D. On the north side of Sawmill Creek, 3.5 miles north-northwest of Yale.
CLAIMS: PIPE 1 to 20.
ACCESS: By logging road from Yale.
OWNER: JOHN McGORAN, 3091 West Third Avenue, Vancouver 8.
METALS: Copper, molybdenum.
DESCRIPTION: Sulphides are disseminated in a breccia zone.

(92H/12)

WORK DONE: Geological survey and geochemical survey, 64 soil samples and 15 stream sediment samples covering Pipe 1-4.

REFERENCE: Assessment Report 3797.

COG (No. 100, Fig. B)

LOCATION: Lat. 49° 31.8'-33.6' Long. 121° 44.4'-46.4' (92H/12)
NEW WESTMINSTER M.D. At elevations of 200 to 4,000 feet on the east side of Harrison Lake, one-half mile north of the junction of Cogburn and Talc Creeks.

CLAIMS: COG, totalling 32.

ACCESS: By secondary road from Harrison Hot Springs.

OWNER: HELICON EXPLORATIONS LIMITED, 145 East 15th Street, North Vancouver.

DESCRIPTION: The claims are underlain by fine-grained peridotite and hornblende diorite.

WORK DONE: Geological mapping, 1 inch equals 400 feet, geochemical survey, and magnetometer survey during 1971.

REFERENCE: Assessment Report 3635.

AL (No. 96, Fig. B)

LOCATION: Lat. 49° 33.5' Long. 121° 42.6' (92H/12E)
NEW WESTMINSTER M.D. On Cogburn Creek, 2.5 miles from Harrison Lake.

CLAIMS: AL 1 to 6.

ACCESS: By road from Harrison Hot Springs, 29 miles.

OPERATOR: WESTERN STANDARD SILVER MINES LTD., Box 462, Kelowna.

METALS: Copper, very minor nickel.

DESCRIPTION: Quartz diorite intrudes metavolcanic and pelitic rocks intercalated with migmatite.

WORK DONE: Surface geological mapping, 1 inch equals one-half mile and preliminary geochemical soil survey, 47 samples covering all claims.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 284.

LOC (No. 236, Fig. B)

LOCATION: Lat. 49° 58.5' Long. 120° 54.5' (92H/15W)
NICOLA M.D. At approximately 4,500 feet elevation on Salem Creek, 1 mile east of Coldwater River.

CLAIMS: LOC 1 to 4.

ACCESS: By the Coldwater River road from Merritt, 13 miles.

OWNER: BELCARRA EXPLORATIONS LTD., 420, 475 Howe Street, Vancouver 1.

DESCRIPTION: Nicola Group volcanic rocks are cut by granitic intrusions.

WORK DONE: Line-cutting and magnetometer survey, 4 line-miles covering Loc 1-4.

REFERENCE: Assessment Report 4088 (line-cutting).

ESP (No. 263, Fig. B)

LOCATION: Lat. 49° 45.5' Long. 120° 33' (92H/15E)
SIMILKAMEEN and NICOLA M.D. Two miles southwest of the middle of Missezula Lake.
CLAIMS: ESP 3 to 6, 33 to 38, 49, 50, 58, 73 to 80, 96, 97.
ACCESS: By road, 10 miles east from Mile 30 on Highway 5.
OWNER: BARRIER REEF RESOURCES LTD., 1418, 355 Burrard Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Rocks on the claim group consist of grey to green andesite and andesite breccia which has been locally fractured by north to northwest-trending faults and shears. Some chalcopyrite was noted.
WORK DONE: A reconnaissance geochemical survey, 250 samples.
REFERENCE: Assessment Report 4167.

NORTH MDA (No. 237, Fig. B)

LOCATION: Lat. 49° 47' Long. 120° 32.5' (92H/15E)
SIMILKAMEEN and NICOLA M.D. At approximately 4,400 feet elevation on the west side of Missezula Lake, at its centre.
CLAIMS: MDA 84, 86, 154, 156, 158, 167 to 174; CORB 1, 3, 7 to 10, 14, 16 to 19, 24 to 30, CORB 22 and 23 Fractions.
ACCESS: By Highway 5 from Princeton, 21 miles.
OWNER: SHEBA COPPER MINES LIMITED, 703, 535 Thurlow Street, Vancouver 5.
WORK DONE: Claims surveyed; magnetometer survey, 4 line-miles and geochemical soil survey, 430 samples covering MDA 84, 86, 167-174 and Corb 25, 27, and 23 Fraction.

BOSS, GAIL (No. 132, Fig. B)

LOCATION: Lat. 49° 49'-54' Long. 120° 34.5'-37.5' (92H/15E)
NICOLA M.D. At approximately 4,000 feet elevation between Bluey Lake and Highway 5, 3 to 8 miles south of Aspen Grove.
CLAIMS: BOSS, GAIL, BIM, TIGHT, LO, J, totalling 170.
ACCESS: By road from Merritt, 26 miles.
OWNER: Adonis Mines Ltd.
OPERATOR: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.
METAL: Copper.
DESCRIPTION: Chalcocite and native copper occur in Nicola Group volcanic rocks.
WORK DONE: Topography mapped; surface diamond drilling, three holes totalling 834 feet on Boss 80 and 115 and Gail 82.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 287 (AXE).

MARGE (No. 235, Fig. B)

LOCATION: Lat. 49° 54′-55.5′ Long. 120° 37.5′-39′ (92H/15E)
NICOLA M.D. Along the west side of Highway 5, from 1 to 2.5 miles south of Aspen Grove.

CLAIMS: MARGE 5 to 24.

ACCESS: Highway 5 crosses the northeast corner of the property.

OPERATOR: HIGHLAND MERCURY MINES LIMITED, 700, 1177 West Hastings Street, Vancouver 1.

DESCRIPTION: The property is apparently underlain by Nicola Group volcanic and sedimentary rocks.

WORK DONE: Geochemical survey, 7.6 line-miles covering Marge 5, 6, 20 and 22.

REFERENCE: Assessment Report 4089.

VAGAS (No. 234, Fig. B)

LOCATION: Lat. 49° 54′-56.5′ Long. 120° 33′ (92H/15E)
NICOLA M.D. Along the east sides of Alleyne and Kentucky Lakes, 3.5 miles east-southeast of Aspen Grove.

CLAIMS: VAGAS 1 to 28.

ACCESS: From Highway 5, 2.5 miles by several old logging roads.

OWNER: HIGHLAND MERCURY MINES LIMITED, 700, 1177 West Hastings Street, Vancouver 1.

DESCRIPTION: The property is underlain by Nicola Group volcanic rocks (*see* British Columbia Department of Mines and Petroleum Resources Preliminary Map No. 10).

WORK DONE: Geochemical survey, 15 line-miles covering 15 claims.

REFERENCE: Assessment Report 4087.

HH, MIX (No. 71, Fig. B)

LOCATION: Lat. 49° 54.8′ Long. 120° 36.2′ (92H/15E)
NICOLA M.D. East of Highway 5, 3 miles south-southeast of Aspen Grove.

CLAIMS: HH 1 to 6, MIX 1 to 9, 3 WAY 11 and 12.

ACCESS: By road from Aspen Grove.

OWNER: ASPEN GROVE MINES LTD., 3428 East 28th Avenue, Vancouver 12.

METAL: Copper.

DESCRIPTION: Malachite and chalcopyrite occur in limestone, limy argillite, and green volcanic breccia of the Nicola Group.

WORK DONE: Magnetometer survey covering Mix 1-4, 7, 8 and HH 2-4.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 380; Assessment Report 3686.

EMERALD (No. 70, Fig. B)

LOCATION: Lat. 49° 55.3' Long. 120° 35.5' (92H/15E)
NICOLA M.D. At an elevation of 4,000 feet 2 miles southeast of Aspen Grove, immediately north and west of Miner Lake.

CLAIMS: EMERALD 1 to 15, EMERALD 16 to 18 Fractions.

ACCESS: By Highway 5 and the Alleyne Lake road from Aspen Grove, 6 miles.

OWNER: KRANCOR OIL & GAS LTD., 41, 553 Granville Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Malachite, chalcocite, and minor chalcopyrite occur in shear zones and flow tops in red volcanic breccia and massive autobrecciated augite porphyry flows of the Nicola Group.

WORK DONE: Magnetometer and geochemical surveys.

REFERENCE: Assessment Report 3758.

DAGO, OPEN (No. 69, Fig. B)

LOCATION: Lat. 49° 55.5' Long. 120° 37' (92H/15E)
NICOLA M.D. At approximately 3,600 feet elevation on the east side of Kidd Lake, 1 mile south-southeast of Aspen Grove store.

CLAIMS: DAGO 1 to 34, DAGO Fraction, OPEN 1 to 35.

ACCESS: By Highway 5 from Merritt, 20 miles.

OWNERS: White River Mines Ltd. and Newco Ventures Ltd.

OPERATOR: WHITE RIVER MINES LTD., 1155, 555 Burrard Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Chalcopyrite, bornite, and some native copper occur in argillite, coral limestone, and clastic breccia at the contact between a sedimentary and a volcanic assemblage of the Nicola Group.

WORK DONE: Claims mapped (partial); surface geological mapping, 1 inch equals 200 feet; ground magnetometer survey, 13.5 line-miles; induced polarization survey, 11 line-miles; and geochemical soil survey, 642 samples covering Dago 1-9 and Open 17, 19, 21, 23, 25, 29; gravity survey, approximately 2 line-miles covering Dago 7 and 8 and Open 29; surface diamond drilling, 14 holes totalling 6,318 feet on Dago 5-9 and Open 21 and 29.

REFERENCES: Assessment Reports 3787, 3788, 3789.

DOTE (No. 68, Fig. B)

LOCATION: Lat. 49° 56.6' Long. 120° 36.3' (92H/15E)
NICOLA M.D. At approximately 3,600 feet elevation straddling Highway 5 in the vicinity of Aspen Grove.

CLAIMS: DOTE 1 to 9, 11 to 37, DOTE 1 Fraction.

ACCESS: By gravel road from Aspen Grove, 1 mile east and west.

OWNER: Dawood Mines Ltd.

OPERATORS: DAWOOD MINES LTD., Box 1499, Merritt and AMAX EXPLORATION, INC., 601, 535 Thurlow Street, Vancouver 5.

(92H/15E)

METAL: Copper.

DESCRIPTION: The property is underlain predominantly by Nicola Group volcanic and sedimentary rocks. Minor chalcopyrite and chalcocite are found along minor shears in the volcanic rocks and as small disseminated pods in the graphitic argillites which underlie the main valley occupied by Highway 5.

WORK DONE: Claims mapped (in part); surface geological mapping, 1 inch equals 400 feet; ground magnetometer survey, 20 line-miles; geochemical soil survey, approximately 800 samples covering all claims; induced polarization survey, 10 line-miles covering Dote 15-21; geochemical soil survey, 150 samples covering Dote 1-8 (Dawood Mines Ltd.); surface diamond drilling, three holes totalling 1,389 feet on Dote 17 and 18.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 287; Assessment Reports 3687, 4078, 4079.

HALO, BROATCH (No. 131, Fig. B)

LOCATION: Lat. 49° 57' Long. 120° 35' (92H/15E)
NICOLA M.D. At approximately 3,800 feet elevation 2 miles northeast of Aspen Grove.

CLAIMS: HALO, BROATCH, LOU, CHALCO, MAGNUS, VIN, TOUCH, TOP, RAM A, RAM, EX, SNO, totalling 56 (the claims cover several old showings including BIG SIOUX, BIG DUTCHMAN, and GOLDEN SOVEREIGN).

ACCESS: By good gravel road from Highway 5, 2 miles north of Aspen Grove, 2 miles.

OWNER: David Minerals Ltd.

OPERATOR: AMAX EXPLORATION, INC., 601, 535 Thurlow Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: Property is underlain by Upper Triassic Nicola Group volcanic rocks comprising flows and pyroclastic and sedimentary rocks which have been intruded by related alkalic stocks. Chalcocite, chalcopyrite, malachite, and minor native copper are found related to regional faults and/or small diorite or diorite breccia intrusions.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; magnetometer survey, 28 line-miles covering all claims except Chalco 1 and 2; induced polarization survey, 6.3 line-miles covering Halo 1-4, Halo Fraction, Halo 2 Fraction, Touch 3, 4, 6, 10, and Broatch 2; geochemical soil survey, 1,099 samples covering all claims except Chalco 1 and 2; percussion drilling, 22 holes totalling 6,407 feet on Halo 1-4, Halo Fraction, Halo 2 Fraction, Touch 3, 4, 6, 10, and Broatch 2.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 285, 286; *Geol. Surv., Canada*, Mem. 243, pp. 93, 94.

CC (No. 66, Fig. B)

LOCATION: Lat. 49° 59′ Long. 120° 42′ (92H/15E)
NICOLA M.D. Immediately west of Kane Lake, 4 miles northwest of Aspen Grove.
CLAIMS: CC 1 to 20.
ACCESS: By Highway 5 and secondary road from Aspen Grove.
OWNER: ARMADA EXPLORATIONS LTD., 551 Howe Street, Vancouver 1.
WORK DONE: Magnetometer survey.
REFERENCE: Assessment Report 3558.

POGO (No. 133, Fig. B)

LOCATION: Lat. 49° 59′ Long. 120° 41′ (92H/15E)
NICOLA M.D. At approximately 4,000 feet elevation northeast of Harman Lake, 4 miles northwest of Aspen Grove.
CLAIMS: POGO 1 to 22.
ACCESS: By road from Merritt, 14 miles.
OWNER: THOR EXPLORATIONS LTD., 301, 540 Burrard Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: The property is underlain by Nicola volcanic and Princeton sedimentary rocks.
WORK DONE: Electromagnetic survey, 1 line-mile covering Pogo 15, 16, 19, 20, 22; geochemical soil survey, 153 samples covering Pogo 1, 3, 15-17.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, pp. 287, 288; Assessment Report 4086.

TOP (No. 233, Fig. B)

LOCATION: Lat. 49° 55.2′-56.5′ Long. 120° 43.5′-45′ (92H/15)
NICOLA M.D. Between 4,200 and 4,600 feet elevation on the north side of Voght Creek, 5 miles west of Aspen Grove.
CLAIMS: TOP 1 to 36, UNO 5 to 18.
ACCESS: From Highway 5 near Aspen Grove by the Kane Valley road, 8 miles.
OPERATOR: ALAKON METALS LTD., 210, 470 Granville Street, Vancouver 2.
WORK DONE: Surface geological mapping, 1 inch equals 200 feet covering Top 6; magnetometer survey, 2 line-miles covering Top 4-6 and Uno 5; geochemical soil survey, 1,173 samples covering Top 1-14, 17-33 and Uno 5-10, 12-17; percussion drilling, eight holes totalling 955 feet on Top 6.
REFERENCE: Assessment Report 4172.

COPPER STAR (DOR) (No. 65, Fig. B)

LOCATION: Lat. 49° 59.9′ Long. 120° 36.0′ (92H/15E; 92I/2E)
NICOLA M.D. Between 3,500 and 4,000 feet elevation at Courtenay Lake on Highway 5, 11 miles southeast of Merritt.

(92H/16W)

CLAIMS: DOR 1 to 34. (The old COPPER STAR workings are on DOR 19 and 29, 1,000 feet south of Courtenay Lake.)

ACCESS: By highway from Merritt, approximately 15 miles.

OWNER: TANJO MINES LTD., 520, 602 West Hastings Street, Vancouver 2.

METALS: Copper, silver.

DESCRIPTION: Silver values with chalcopyrite, chalcocite, secondary copper carbonates, and a little native copper occur in a brecciated zone in augite andesite porphyry of the Nicola Group.

WORK DONE: Surface geological mapping, 1 inch equals 100 feet; magnetometer and electromagnetic survey, 30 line-miles; and geochemical soil survey, 1,100 samples covering all claims; hand trenching and blasting on Dor 10.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1915, pp. 223, 226, 227; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 286; *Geol. Surv., Canada,* Mem. 243, p. 93; Assessment Reports 2481, 3061, 3688.

SIWASH (No. 134, Fig. B)

LOCATION: Lat. 49° 49.7' Long. 120° 23.4' (92H/16W)
SIMILKAMEEN M.D. At approximately 5,000 feet on the east side of Siwash Creek, 10 miles northwest of Bankeir.

CLAIMS: SIWASH 1 to 18, 21 to 28, 31 to 32, SIWASH 1 Fraction.

ACCESS: By the Princeton-Summerland road from Princeton, 45 miles.

OPERATOR: PHELPS DODGE CORPORATION OF CANADA, LIMITED, 404, 1112 West Pender Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Copper mineralization occurs in albite-epidote-chlorite alteration zones of limited size near the contacts of a large northwest-trending granodiorite dyke with andesite flow rocks of the Nicola Group. Chalcopyrite and minor chalcocite occur occasionally with magnetite in narrow shear zones and fractures in the volcanic rocks or as disseminations and fracture fillings in hybrid granitoid rocks near the southern contact of the dyke.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet covering Siwash 1-8, 11, 13, 15, 17; magnetometer survey, 9 line-miles covering same claims; geochemical survey, 240 soil samples and 60 rock samples covering same claims.

REFERENCE: Assessment Report 4077.

BLUEY (No. 241, Fig. B)

LOCATION: Lat. 49° 53'-55.5' Long. 120° 27'-29' (92H/16W)
NICOLA M.D. On Pothole Creek, 7 miles east-southeast of Aspen Grove.

CLAIMS: BLUEY 1 to 3, 21 to 32, 41 to 70, 83, 84, SS 1 to 7.

ACCESS: By a forest road which joins Highway 5 about 2 miles south of Aspen Grove.

(92H/16W, 9W)

OWNER: BALFOUR MINING LTD., 411, 475 Howe Street, Vancouver 1.

DESCRIPTION: The property is underlain by Nicola volcanic and sedimentary rocks (*see* British Columbia Department of Mines and Petroleum Resources Preliminary Map No. 10).

WORK DONE: Geochemical soil survey, approximately 190 samples; airborne magnetometer survey.

REFERENCES: Assessment Reports 4081, 4082.

TOP, FIX (No. 240, Fig. B)

LOCATION: Lat. 49° 44'-47' Long. 120° 19'-25' (92H/16W, 9W)
SIMILKAMEEN M.D. West of the junction of Siwash and Teepee Creeks.

CLAIMS: TOP, FIX, ROSSO No. 1, KEN, DUKE, PET, AL, totalling 189.

ACCESS: By dirt roads from Osprey Lake, 8 to 16 miles.

OWNER: SPA MINES LIMITED, 411, 470 Granville Street, Vancouver 2.

METALS: Copper, lead, zinc, silver.

WORK DONE: Trenching, 30,660 square feet and stripping, 8,800 square feet on Top 50, 50A, and 72; percussion drilling, four holes totalling 1,150 feet.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 280.

AMANDA (No. 125, Fig. B)

LOCATION: Lat. 49° 44'-47.5' Long. 120° 18'-21' (92H/16W, 9W)
SIMILKAMEEN M.D. Between 3,600 and 4,200 feet elevation on Siwash Creek, 6 miles northwest of Bankeir and 24 miles northeast of Princeton.

CLAIMS: AMANDA 1 to 24, AMIE 1 and 2, PACO 1 to 20, 101 Fraction. (The AMIE claims cover the old SNOWSTORM and RENFREW showings.)

ACCESS: By logging road from Bankeir, 6 to 9 miles.

OWNER: DIANA EXPLORATIONS LTD., 411, 470 Granville Street, Vancouver 2.

METALS: Silver, lead, zinc, copper, gold.

DESCRIPTION: Sulphides consisting of pyrite, chalcopyrite, bornite, tetrahedrite, galena, and sphalerite occur in shear zones in quartz monzonite and granodiorite.

WORK DONE: Road repair, prospecting, and rock sampling of areas outlined in geochemical survey conducted in 1971.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 276, 277.

TC (No. 135, Fig. B)

LOCATION: Lat. 49° 45.5'-47.5' Long. 120° 04.5'-12.5' (92H/16E)
SIMILKAMEEN M.D. Between 3,900 and 5,500 feet elevation on Spring and Trout Creeks, 14 miles south of Pennask Lake.

CLAIMS: Seventy-four TC, PO 1 to 62.

(92H/16E)

ACCESS: By road from Peachland, 25 miles.

OWNER: PAN OCEAN OIL LTD., 1050 Three Calgary Place, 355 Fourth Avenue SW., Calgary, Alta.

METAL: Copper.

DESCRIPTION: A Tertiary quartz feldspar porphyry intrudes various phases of the older Coast Intrusions. The northeast part of the property is underlain by a small area of hornfelsed metavolcanic and metasedimentary rocks.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet; geochemical soil survey, 631 samples.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 289; Assessment Report 4335.

BRENDA MINE (No. 265, Fig. B)

By David Smith

LOCATION: Lat. 49° 52.8' Long. 120° 00.5' (92H/16E)
OSOYOOS M.D. One and one-half miles southeast of Brenda Lake.

CLAIMS: Mineral Leases M-58, M-59, M-77, M-78, M-79, M-82, M-83, plus 238 claims and fractions. The open pit lies primarily within Mineral Lease M-58.

ACCESS: Access to the property is provided by 14 miles of paved road and 4 miles of gravel road from Peachland.

OWNER: BRENDA MINES LTD., Box 420, Peachland.

METALS: Copper, molybdenum (production shown in Table I).

WORK DONE:

Open-pit mining is carried out on 50-foot benches; 50-foot berms. Drilling is done by a 12 1/4-inch drill and a 9 7/8-inch drill. Equipment consists of three 11-cubic-yard shovels and twelve 100-ton trucks.

In 1972, 18,094,900 tons of material was removed from the pit, consisting of 8,957,900 tons of mill feed ore; 3,232,400 tons of low-grade stockpile ore; 5,902,100 tons of waste; and 93,000 tons of overburden.

During the year additions to the plant consisted of a copper regrind circuit and a rotary drier.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 391; 1971, p. 288.

ASHCROFT 92I

COMSTOCK (LEADVILLE, LUCKY TODD) (No. 64, Fig. B)

LOCATION: Lat. 50° 02.7' Long. 120° 45.7' (92I/2)
NICOLA M.D. At 5,500 feet elevation on Iron Mountain, 5 miles south-southeast of Merritt.

CLAIMS: MAKELSTIN, totalling 57.

ACCESS: By Coldwater road and microwave tower road from Merritt, 14 miles.

OWNER: ACAPLOMO MINING & DEVELOPMENT CO. LTD., Box 277, Merritt.

(92H/15E; 92I/2E)

METALS: Lead, copper, silver.

DESCRIPTION: A galena-barite vein occurs in a strong north-south shear zone. Bedrock is Nicola Group volcanic rocks including tuff, andesite, rhyolite, and basalts. Silver anomalies are associated with an east-west structural feature deduced from magnetic results. Copper occurs as disseminatons in andesite and rhyolite and in quartz-calcite veins carrying malachite, azurite, chrysocolla, hematite, chalcocite, bornite, and chalcopyrite.

WORK DONE: Line-cutting; electromagnetic survey, 3 line-miles and magnetometer survey, 3 line-miles covering Makelstin 53, 54, 55B, and 56B; trenching, 400 feet on Makelstin 1 and 59; surface diamond drilling, two holes totalling 382 feet on Makelstin 22A.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 291; Assessment Reports 3711, 3791.

COPPER STAR (DOR) (No. 65, Fig. B)

LOCATION: Lat. 49° 59.9' Long. 120° 36.0' (92H/15E; 92I/2E)
Report on this property in section 92H/15E.

BUD (No. 224, Fig. B)

LOCATION: Lat. 50° 01.5'-03.5' Long. 120° 33.5'-35' (92I/2E)
NICOLA M.D. From 1 to 3 miles north of Courtenay Lake and 10 miles southeast of Merritt.

CLAIMS: BUD 1, 3, 5, 7 to 18, 21 to 26.

ACCESS: By Highway 5 from Merritt.

OWNERS: P. S. Barrett and L. Olheiser.

OPERATOR: G. S. ELDRIDGE, 2907 West 42nd Avenue, Vancouver 13.

WORK DONE: Geochemical, magnetic, and electromagnetic surveys over 13 line-miles.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 290; Assessment Report 4076.

DAN (No. 232, Fig. B)

LOCATION: Lat. 50° 04' Long. 120° 39.5' (92I/2E)
NICOLA M.D. Straddling Highway 5, 6 miles southeast of Merritt.

CLAIMS: DAN 1 to 20.

ACCESS: Highway 5 transects the property.

OWNER: TRISON MINES LTD., 715, 602 West Hastings Street, Vancouver 2.

DESCRIPTION: According to Geological Survey of Canada Map 886A, the property is underlain by rocks of the Triassic Nicola Group. An altered dioritic intrusion is reported to outcrop along the forestry road southwest of Marquart Lake.

WORK DONE: Aerial magnetic, electromagnetic, and radioactivity surveys; ground magnetic, electromagnetic and geochemical surveys.

REFERENCE: Assessment Report 4161.

HANK, CU (No. 261, Fig. B)

LOCATION: Lat. 50° 10.5′-12′ Long. 120° 36.5′-38.5′ (92I/2E) NICOLA M.D. Two and one-half miles northeast of Nicola.

CLAIMS: HANK 1 to 10, HANK 101, 102, and 103 Fractions, CU 13 to 22.

ACCESS: By road, 3 miles from Nicola.

OWNER: L. E. PECKHAM, Box 387, Cache Creek.

WORK DONE: Line-cutting.

REFERENCE: Assessment Report 4163.

PEACOCK (No. 59, Fig. B)

LOCATION: Lat. 50° 13.7′ Long. 120° 37.3′ (92I/2E) NICOLA M.D. Between 2,900 and 3,900 feet elevation on Clapperton Creek, 10.5 miles northeast of Merritt.

CLAIMS: PAYROLL 1 to 14, OLD MINE 1 to 12.

ACCESS: By road from Nicola, 4.2 miles.

OPERATOR: PACIFIC PETROLEUMS LTD., Box 6666, Calgary, Alta.

METAL: Copper.

DESCRIPTION: Bornite, chalcopyrite, malachite, and azurite occur in small masses and veins of quartz, and disseminated chalcopyrite and malachite are present locally in a syenodiorite-diorite body.

WORK DONE: Magnetometer survey, 14.1 line-miles; electromagnetic survey, 14.1 line-miles; and geochemical soil survey, 121 samples covering all claims.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1968, p. 197 (CA); *Geol. Surv., Canada,* Mem. 249, p. 130.

CHALCO (No. 63, Fig. B)

LOCATION: Lat. 50° 09.4′-10.7′ Long. 120° 54.6′-57.4′ (92I/2W) NICOLA M.D. At approximately 3,000 feet elevation 2.5 miles south of the Craigmont mine straddling the Promontory Hills forest fire lookout road.

CLAIMS: CHALCO 1 to 44.

ACCESS: By road from Lower Nicola, 2.5 miles.

OPERATOR: PERRY, KNOX, KAUFMAN, INC., Box 14336, Spokane, Washington 99214.

METALS: Copper, iron.

DESCRIPTION: Minor chalcopyrite-pyrite-specularite mineralization is associated with contact zones between Nicola Group volcanic and sedimentary rocks and diorite, quartz diorite, and granite differentiates of the Coyle stock.

WORK DONE: Geochemical soil survey, 132 samples covering portions of Chalco 5, 6, 14-17, 21, 37, 38, and 44.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 273 (Pride, Sid, Ram); Assessment Report 3889.

HAWK (No. 143, Fig. B)

LOCATION:	Lat. 50° 10′ Long. 120° 59′ (92I/2W) NICOLA M.D. At approximately 4,200 feet elevation on the south slope of Promontory Hills, 9.5 miles west-northwest of Merritt.
CLAIMS:	HAWK 1 to 35 (in part a restaking of HANK claims).
ACCESS:	By logging road from Highway 8, 3 miles.
OWNER:	RED RIVER MINES LTD., 210, 535 Howe Street, Vancouver 1.
METAL:	Copper.
DESCRIPTION:	The property is underlain by volcanic and sedimentary rocks of the Triassic Nicola Group which are intruded by granite and diorite of the Coyle stock. The company reports sulphides of copper and cobalt in the Nicola Group rocks.
WORK DONE:	Geochemical soil survey, approximately 200 samples covering 10 claims.
REFERENCES:	*Minister of Mines, B.C.,* Ann. Rept., 1960, pp. 36, 41; 1962, p. 54 (Hank); Assessment Reports 330 (Hank), 4106 (Hawk).

VAL (No. 225, Fig. B)

LOCATION:	Lat. 50° 10.5′ Long. 120° 48′ and (92I/2W) 50° 09′ 120° 46.5 NICOLA M.D. At approximately 3,500 feet elevation 3 and 4 miles north of Merritt.
CLAIMS:	The property is split into two groups – VAL 5 to 16 are centred 1 mile south of Jesse Creek while VAL 17 to 26 lie on the north side of Jesse Creek immediately east of Indian Reserve 1.
ACCESS:	By road from Merritt, 10 miles.
OWNER:	NEWVAN RESOURCES LTD., 211, 850 West Hastings Street, Vancouver 1.
METALS:	Copper, iron.
DESCRIPTION:	Disseminated pyrite, chalcopyrite, and bornite occur in gossans in Nicola greenstone.
WORK DONE:	Trenching, 16,800 cubic feet on Val 5 and 6; surface diamond drilling, 11 holes totalling 1,650 feet on Val 5 and 6.
REFERENCES:	*Minister of Mines, B.C.,* Ann. Rept., 1962, p. 55 (Justice); Assessment Report 1799.

RYE (No. 264, Fig. B)

LOCATION:	Lat. 50° 10.8′ Long. 120° 48.8′ (92I/2W) NICOLA M.D. On the east side of Indian Reserve 1, 5 miles north of Merritt.
CLAIMS:	JESS 1 to 12, UNO 1 to 4 Fractions.
ACCESS:	By road from Merritt, 8 miles.
OWNER:	ALAKON METALS LTD., 210, 470 Granville Street, Vancouver 2.
METALS:	Copper, iron.

(92I/2W)

DESCRIPTION: The claims are underlain by Nicola Group volcanic rocks near intrusions of granitic rocks which appear to be related to the Guichon Creek batholith.

WORK DONE: A reconnaissance soil sample survey.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1963, p. 52; Assessment Reports 2375, 4172.

ES, SA (No. 60, Fig. B)

LOCATION: Lat. 50° 11.4'-13.4' Long. 120° 46.7'-49' (92I/2W)
NICOLA M.D. At 4,000 to 4,500 feet elevation south and west of Morgan Lake, 6 miles north of Merritt, east of Indian Reserve 1.

CLAIMS: ES 1 to 48, SA 1 to 7.

ACCESS: By dirt and logging roads from Merritt.

OPERATOR: MINAS DE CERRO DORADO LTD., 107, 325 Howe Street, Vancouver 2.

DESCRIPTION: The few outcrops on the property may be border phase intrusive rocks of the Guichon Creek batholith.

WORK DONE: Geochemical survey covering ES 1-34, 47, 48.

REFERENCE: Assessment Report 3896.

SHOT (No. 153, Fig. B)

LOCATION: Lat. 50° 12.5' Long. 120° 52.5' (92I/2W)
NICOLA M.D. Two miles east of the Craigmont mine near the tailings pond and adjoining Indian Reserve 1 on the west.

CLAIMS: SHOT 1 to 8, JJM 1 and 2 Fractions, NORA 6 Fraction, VULGAR Fraction.

ACCESS: By the Craigmont mine road, 6 miles from Merritt.

OWNER: DONALD S. PATERSON, 131, Ridgedale Crescent, Winnipeg, Man.

DESCRIPTION: The entire property is covered with overburden to a depth of at least 200 feet. By extrapolation of known geology in the area it is expected that the northern part of the property is underlain by granodiorites of the Guichon Creek batholith, whereas the southern part is underlain by volcanic rocks of the Kingsvale Group.

WORK DONE: A dipole-dipole induced polarization survey over 6,800 feet of line.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1961, p. 40 (Consolidated Standard Mines Limited); Assessment Reports 339, 395, 1686, 4058.

CRAIGMONT MINE (No. 267, Fig. B)

By David Smith

LOCATION: Lat. 50° 12.5' Long. 120° 55.7' (92I/2W)
NICOLA M.D. Between 3,800 and 4,200 feet elevation on the forks of Birkett Creek, 8 miles northwest of Merritt.

CLAIMS: The Craigmont orebodies are on the MERRELL 7 and 8 and the McLEOD 5 and 6 claims. The company holds 106 mineral claims and fractions, 32 of which comprise 10 leases.

(92I/2W)

ACCESS: By road north from Highway 8 and Lower Nicola.

OWNER: CRAIGMONT MINES LIMITED, 700, 1030 West Georgia Street, Vancouver 5; mine address, Box 3000, Merritt.

METALS: Copper, iron (production shown in Table I).

DESCRIPTION:

Underground mining is carried out using drill jumbos and scooptrams on production in what is now a conventional sublevel caving, trackless mining method. Ore and waste are transferred to 2900 level via raises and transported to surface using track haulage.

Mining and milling operations were continuous in 1972. Copper concentrates are loaded at Coyle Siding and hauled by Canadian Pacific Railway to Vancouver. Shipments of magnetite were made to Kaiser coal operation at Natal. Underground work consisted of lateral development, 19,792 feet and diamond drilling, 9,764 feet.

In 1972 the No. 1 hoist and shaft were no longer operative.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 373; 1971, p. 292.

JUA, LOST (No. 61, Fig. B)

LOCATION: Lat. 50° 14.5' Long. 120° 52' (92I/2W)
NICOLA M.D. On Guichon Creek south of its confluence with Tyner Creek, 10 miles north of Merritt.

CLAIMS: JUA 29 to 38, LOST 1 to 3.

ACCESS: By Highway 8 and secondary road from Merritt.

OWNER: G. S. ELDRIDGE, 2907 West 42nd Avenue, Vancouver 13.

WORK DONE: Magnetometer and geochemical surveys, 18.7 line-miles.

REFERENCE: Assessment Report 3673.

JUA (No. 62, Fig. B)

LOCATION: Lat. 50° 12.7'-16' Long. 120° 52'-53.5' (92I/2W, 7W)
NICOLA M.D. One-half mile west of Guichon Creek, 6.5 miles north of Lower Nicola.

CLAIMS: JUA 1 to 28, 39 to 52.

ACCESS: By the Mamit Lake road from Lower Nicola, 6.5 miles.

OWNER: Exel Explorations Ltd.

OPERATOR: TECK CORPORATION LTD., 700, 1177 West Hastings Street, Vancouver 1.

DESCRIPTION: The property is probably underlain in part by the Hybrid phase of the Guichon Creek batholith and in part by volcanic rocks of the Triassic Nicola Group.

WORK DONE: Geochemical soil survey, 1,620 samples covering Jua 1-12, 23-28, 39-45, 47, 51, and 52.

REFERENCE: Assessment Report 3708.

B&B, SPIN (No. 42, Fig. B)

LOCATION: Lat. 50° 20'-23' Long. 121° 36.5'-38.5' (92I/5E)
KAMLOOPS M.D. Between 3,500 and 6,500 feet elevation on Spintlum Creek, on the southwest slope of Botanie Mountain, 10 miles north of Lytton.

CLAIMS: Twenty-five B&B, thirty SPIN, eight FOLLY, four RE-RUN, BOTANIE 1 Fraction.

ACCESS: By Highway 12 and forest access road from Lytton, 10 miles.

OWNER: CANADIAN JOHNS-MANVILLE COMPANY LIMITED, Box 1500, Asbestos, P.Q.

METAL: Copper.

DESCRIPTION: The property is underlain by diorite of the Mount Lytton batholith and by volcanic rocks of the Cretaceous Spences Bridge Group. Chalcopyrite, bornite, and possibly tetrahedrite occur disseminated in altered zones around fractures. Chalcopyrite also occurs with pyrite in quartz veins.

WORK DONE: Geochemical soil survey, 290 samples covering Spin 1-30.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 292; Assessment Report 3827.

COP (No. 144, Fig. B)

LOCATION: Lat. 50° 25.7' Long. 121° 36.4' (92I/5E)
KAMLOOPS M.D. At approximately 5,000 feet elevation at the headwaters of Izman Creek, about 14 miles north of Lytton and 3.5 miles east of the Fraser River.

CLAIMS: COP 1, 2, 15 to 30, ALPINE 1 to 16, BAY 1 and 2, BONNY 13 and 14, CB 1 to 9, KEN 2, KENT 1 and 2, NIP 1 to 8, PAM 1 to 8, REB 1 to 4, SPOT 1 to 6.

ACCESS: By Highway 12 for 14 miles north of Lytton and then 3 miles by forestry access road.

OWNER: Santana International Resources Ltd.

OPERATOR: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: A small pendant of altered sedimentary and volcanic rocks is enclosed within the Mount Lytton batholith. A zone of skarn alteration contains narrow quartz veins mineralized with chalcopyrite and molybdenite.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet; magnetometer survey, approximately 20 line-miles; and geochemical soil survey, 700 samples covering all claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 292, 293; Assessment Reports 3937, 3938, 4119, 4120.

DIANA (VICTORY) (No. 230, Fig. B)

LOCATION: Lat. 50° 26.5'-29' Long. 121° 40'-42' (92I/5E)
KAMLOOPS M.D. Along Highway 12 at Laluwissin Creek.

CLAIMS: DIANA 1 to 47, JUDY 1 to 11. (The old VICTORY showing is in the vicinity of Diana 24 and 28.)

ACCESS: Highway 12 transects the property.

OWNER: COLT RESOURCES LTD. (formerly Cuda Resources Ltd.), 711, 475 Howe Street, Vancouver 1.

DESCRIPTION: According to Geological Survey of Canada Map 1010A, the property is underlain by granitic rocks of the Mount Lytton batholith which are in fault contact west of the highway with volcano-sedimentary rocks of the Cretaceous Lillooet Group.

WORK DONE: Surface geological mapping, 1 inch equals 525 feet; trenching, 600 feet.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 293; *Geol. Surv., Canada,* Mem. 262, p. 102; Map 1010A.

AB (No. 41, Fig. B)

LOCATION: Lat. 50° 29.5' Long. 121° 20' (92I/6W)
KAMLOOPS M.D. At approximately 4,500 feet elevation on the east side of Indian Reserve 6, 1.5 miles west of Martel on the Canadian National Railway line, 4 miles north of Spences Bridge.

CLAIMS: AB 18 to 25.

ACCESS: By the Trans-Canada Highway and the road up Twaal Creek from Spences Bridge, 8.5 miles.

OWNER: ANGLO-BOMARC MINES LTD., 301, 540 Burrard Street, Vancouver 1.

DESCRIPTION: The property lies along the contact between Spences Bridge volcanic rocks and metamorphic rocks of the Cache Creek Group.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering AB 20, 21, 24, and 25; electromagnetic survey, 1 line-mile covering AB 20 and 24; geochemical soil survey, 30 samples covering AB 20 and 24.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 294; Assessment Report 3799.

MEL (No. 43, Fig. B)

LOCATION: Lat. 50° 24.0' Long. 121° 11.0' (92I/6E)
KAMLOOPS M.D. At approximately 5,000 feet elevation about 2 miles west of Pimainus Lakes and south of Pimainus Creek.

CLAIMS: MEL 1, 2, 4, 6 to 10.

ACCESS: By the Skuhun Creek and Papsilqua Creek roads from Spences Bridge, 27.3 miles or from Ashcroft by Pimainus Lake road past the OK (Alwin) mine.

OWNER: ANGLO-BOMARC MINES LTD., 301, 540 Burrard Street, Vancouver 1.

(92I/6E)

DESCRIPTION: Reconnaissance geological mapping revealed scattered outcrops of Spences Bridge Group volcanic rocks on Mel 4, 6, 7, and 8. A veneer of glacial outwash silts covers bedrock on the other claims.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Mel 4, 6-8; geochemical soil survey, 20 samples covering Mel 1.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 345; Assessment Report 3798.

TOKETIC (DORA KAY) (No. 231, Fig. B)

LOCATION: Lat. 50° 27.7' Long. 121° 12.8' (92I/6E)
KAMLOOPS M.D. On the north side of Pimainus Creek, 7 miles northeast of Spences Bridge.

CLAIMS: GD 1 and 2, TOM 1, 3, 6, and 7, VL 14 to 19, TJM 1 to 8.

ACCESS: By dirt road from Highway 8, 2 miles east of Spences Bridge, to Pimainus Creek, thence along the north side of the creek.

OWNER: Valley Copper Mines Limited.

OPERATOR: COMINCO LTD., Trail.

METALS: Iron, copper.

DESCRIPTION: Fracture fillings of specular hematite with minor chalcopyrite occur in Hybrid phase rocks of the Guichon Creek batholith near the contact with metasedimentary rocks tentatively assigned to the Permian Cache Creek Group.

WORK DONE: A geochemical survey on Tom 6 and VL 14 and 15.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1926, p. 194 (Dora Kay); 1961, p. 29; 1963, p. 43; *Geol. Surv., Canada*, Mem. 262, p. 105; Assessment Reports 151, 335, 4121.

LORNEX (No. 222, Fig. B)

By E. Sadar and W. J. McMillan

LOCATION: Lat. 50° 28' Long. 121° 01' (92I/6E)
KAMLOOPS M.D. Highland Valley, 2 miles south of Quiltanton Lake.

CLAIMS: Mineral Leases M-48 to M-145 and other claims including AWARD, SKEENA COPPER, AM, LORNEX SOUTH, totalling 454.

ACCESS: By the Highland Valley road from Ashcroft, or by the Lac Le Jeune road from Kamloops.

OWNER: LORNEX MINING CORPORATION LTD., 202, 580 Granville Street, Vancouver 2.

METALS: Copper, molybdenum (production shown in Table I).

DESCRIPTION:

Stripping during open-pit development (Plate I) has exposed mainly Skeena granodiorite which is cut on the southeast wall of the pit by a body of leucocratic quartz porphyry. The quartz porphyry is irregularly distributed in the pit area. Recent trenching by Highmont Mining Corp. Ltd. suggests that the porphyry is connected to the composite Gnawed Mountain porphyry dyke and that both dykes are offshoots from the Bethsaida quartz monzonite (Fig. 12).

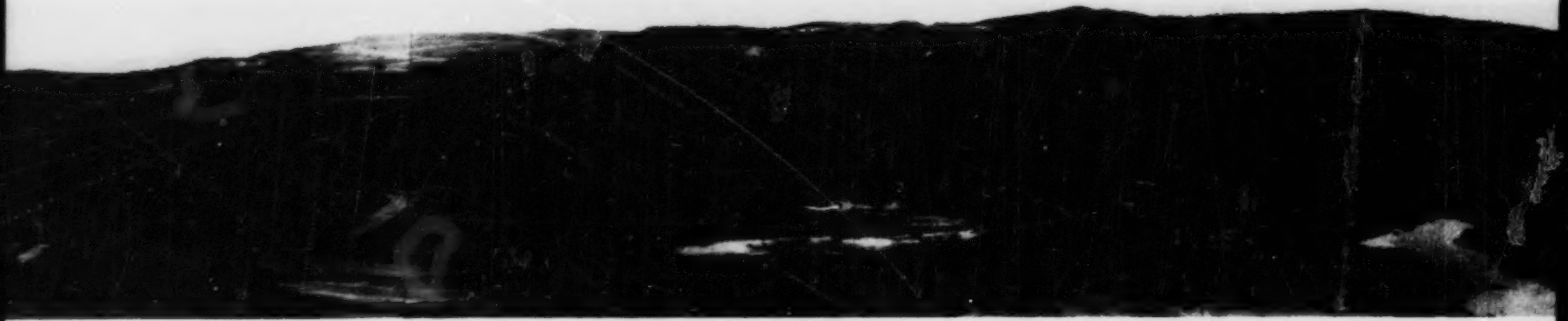


Plate I. View of the Lornex open pit from the west wall (August 1972).

(92I/6E)

WORK DONE:

Mining is carried out by conventional open-pit mining methods with benches being developed on a 50-foot vertical interval. The major mining equipment is as follows: three Bucyrus-Erie 45-R rotary drills; four P&H 2100B 15-cubic-yard electric shovels; twenty-two Wabco 120B 120-ton haulage trucks.

There was no exploration work undertaken in 1972. The pre-production development of the orebody was completed during the year and the mine and concentrator started production on October 1, 1972.

Concurrent with the pre-production development of the open pit the construction of a 38,000-ton-per-day copper-molybdenum concentrator and ancillary facilities such as water supply and tailings disposal systems, etc., were completed.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 340.

BAR (No. 107, Fig. B)

LOCATION: Lat. 50° 28.0' Long. 121° 09.0' (92I/6E)
KAMLOOPS M.D. Between 400 and 600 feet elevation approximately 3 miles southwest of the Alwin mill and 14,000 feet due west of Calling Lake.
CLAIMS: BAR 1 to 40.
ACCESS: By the Highland Valley and Alwin roads from Ashcroft, 32 miles.
OWNER: NORTHLODE EXPLORATION LTD., 911, 470 Granville Street, Vancouver 2.
METAL: Copper.
DESCRIPTION: The claims straddle the contact between the Guichon variety and Hybrid phase of the Guichon Creek batholith. Outcrop is abundant. Epidote and chlorite alteration occur adjacent to some fractures. Bornite and chalcopyrite occur locally in the altered zones.
WORK DONE: Topography mapped; surface geological mapping; geochemical soil survey, 6 samples covering Bar 1-11; trenching, 55,750 cubic feet on Bar 1, 23, 25, and 27; stripping, 3,400 feet by 15 feet by 2 feet on Bar 1, 4, 6, 23, 25-27, and 30.
REFERENCES: Assessment Reports 1199, 4069.

MB (No. 106, Fig. B)

LOCATION: Lat. 50° 29' Long. 121° 12' (92I/6E)
KAMLOOPS M.D. At approximately 4,500 feet elevation 3 miles west of Island Lake on Inkikuh Creek.
CLAIMS: MB, totalling 20.
ACCESS: From the Highland Valley Highway via the Jim Black Lake road, 8 miles.
OWNER: RIVIERA INDUSTRIES & RESOURCES LTD., 200, 505 Burrard Street, Vancouver 1.
WORK DONE: Surface diamond drilling, two holes totalling 397 feet on MB 51 and 52.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 258.

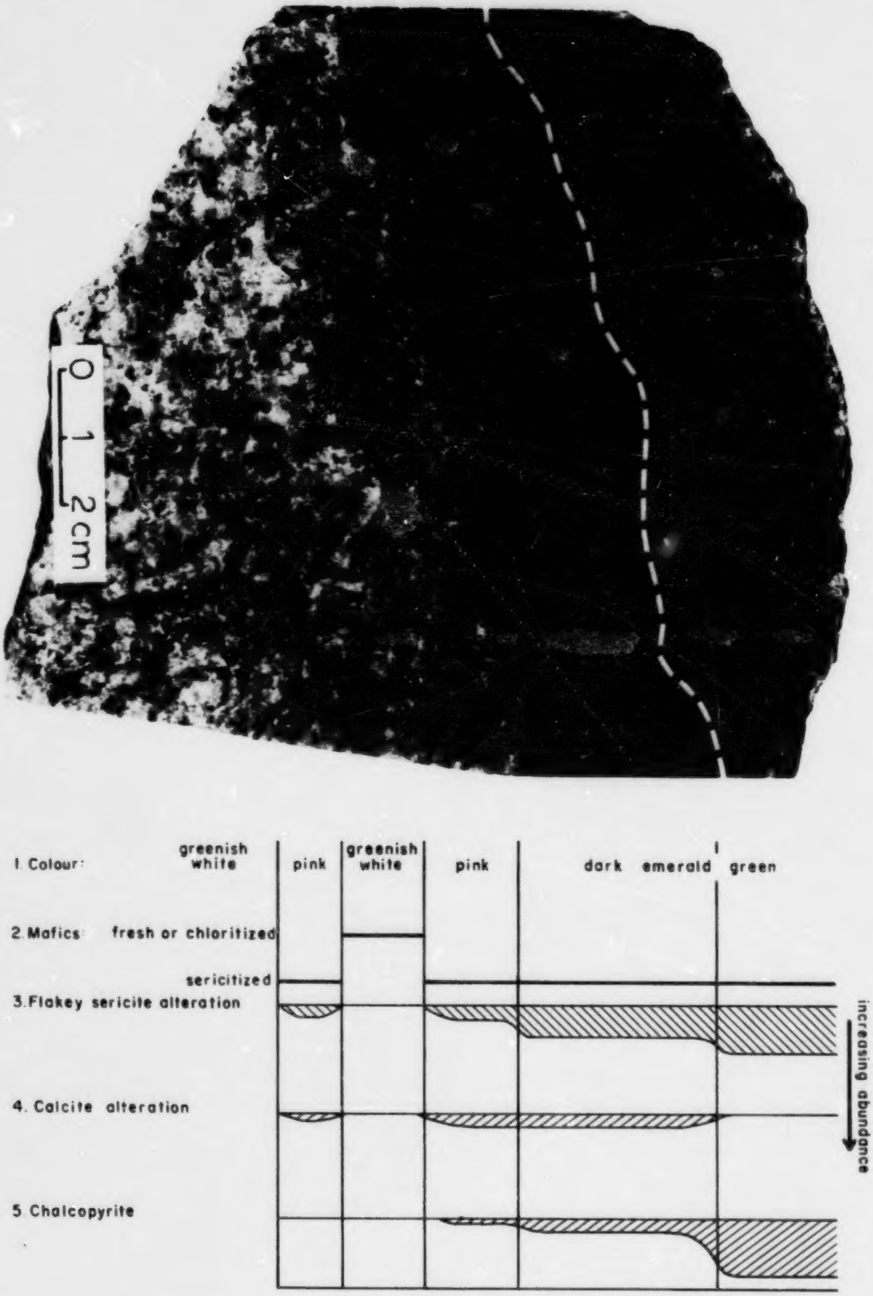

0 1 2 cm
1. Colour:
greenish white
pink
greenish white
pink
dark emerald green
2. Mafics: fresh or chloritized
sericitized
3. Flakey sericite alteration
4. Calcite alteration
5. Chalcopyrite
increasing abundance

Plate II. Ore-waste contact. OK (Alwin) mine.

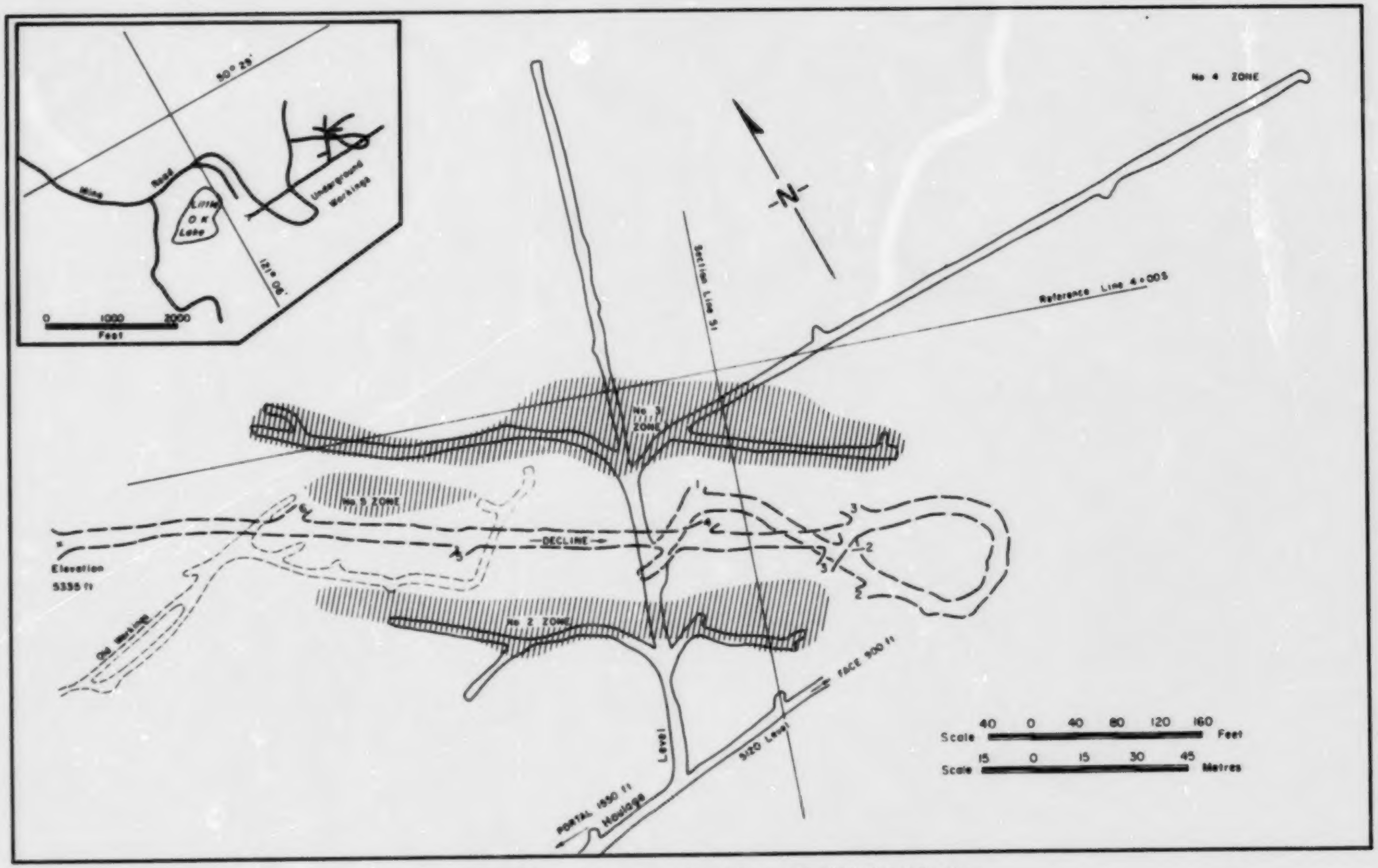
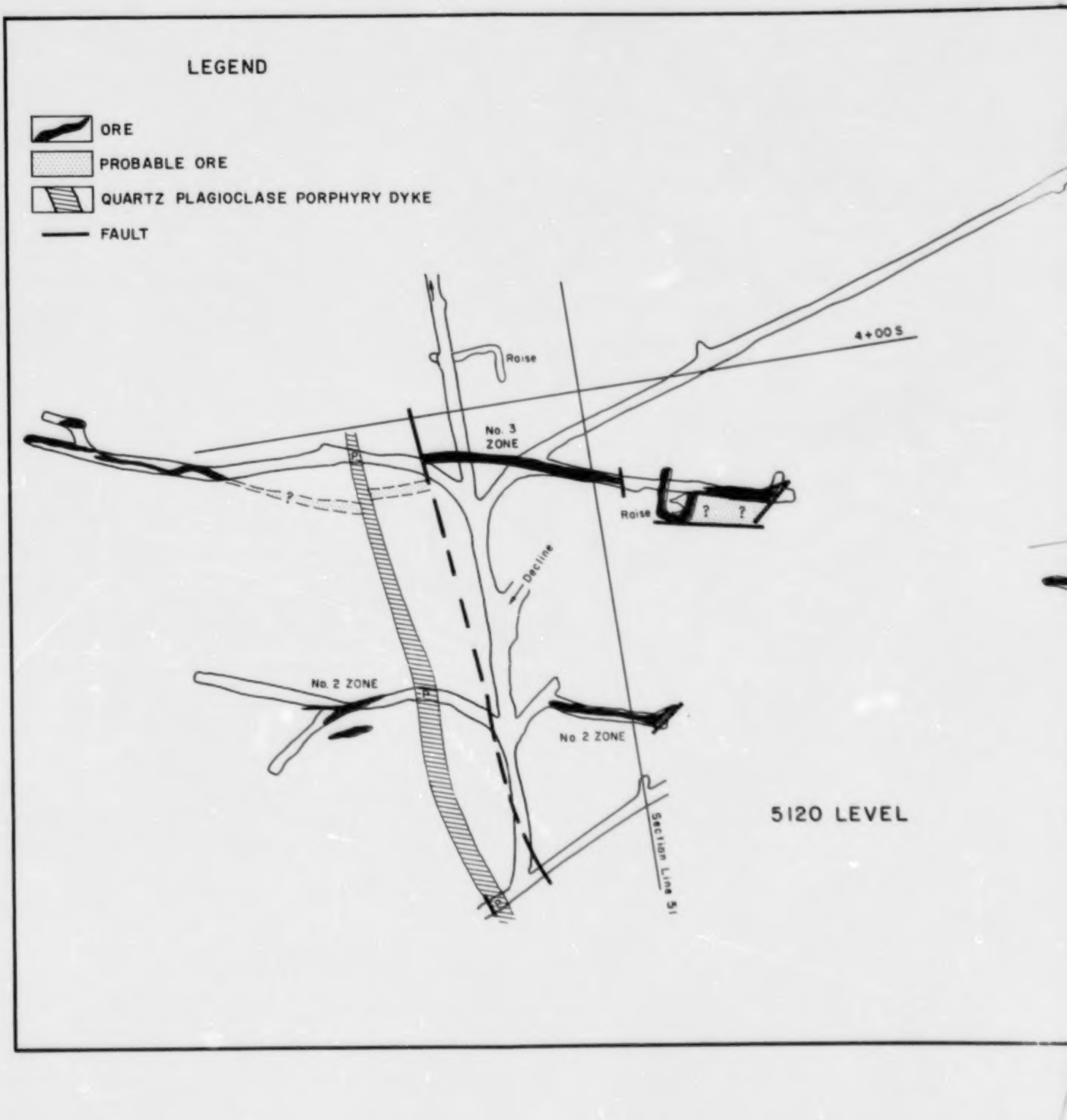
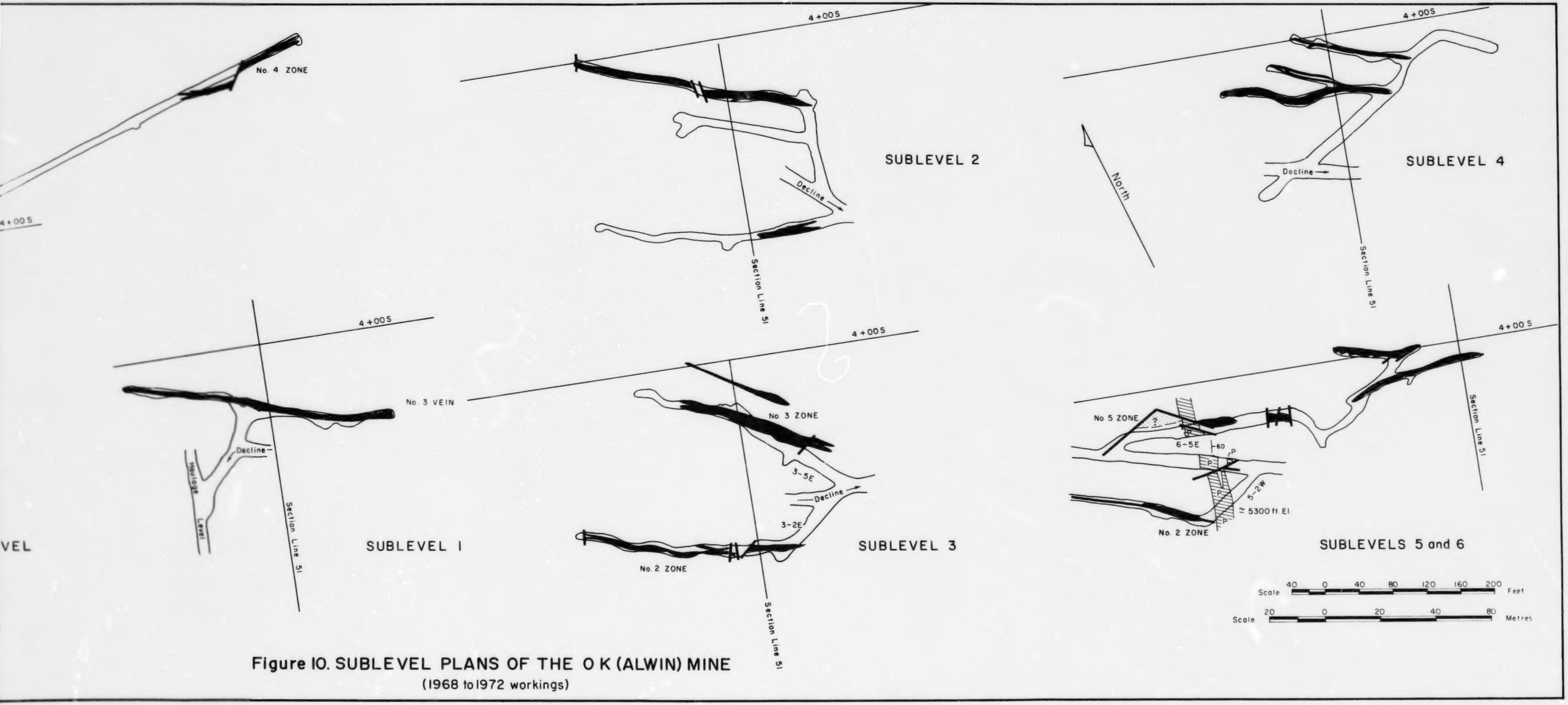

Mine
Road
Little
O K
Lake
Underground
Workings
50° 29'
121° 06'
0
1000
2000
Feet
No 4 ZONE
N
Section Line 51
Reference Line 4+00S
No 3
ZONE
No 5 ZONE
DECLINE
Elevation
5335 ft
Old Workings
No 2 ZONE
FACE 900 ft
5120 Level
Level
PORTAL 1550 ft
Haulage
Scale 40 0 40 80 120 160 Feet
Scale 15 0 15 30 45 Metres

Figure 9. Underground workings at the OK (Alwin) mine.


LEGEND
ORE
PROBABLE ORE
QUARTZ PLAGIOCLASE PORPHYRY DYKE
FAULT
Raise
4+00 S
No. 3
ZONE
P
?
Raise
? ?
Decline
No. 2 ZONE
No. 2 ZONE
Section Line 51
5120 LEVEL



No. 4 ZONE
4+00S
VEL
4+00S
Section Line 51
Decline
SUBLEVEL 2
4+00S
North
Decline
SUBLEVEL 4
Section Line 51
4+00S
No. 3 VEIN
Decline
Haulage Level
Section Line 51
SUBLEVEL 1
4+00S
No. 3 ZONE
3-5E
Decline
3-2E
No. 2 ZONE
Section Line 51
SUBLEVEL 3
4+00S
No 5 ZONE
?
6-5E
60
P
5-2W
≃ 5300 ft El
No. 2 ZONE
Section Line 51
SUBLEVELS 5 and 6
Scale 40 0 40 80 120 160 200 Feet
Scale 20 0 20 40 80 Metres

Figure 10. SUBLEVEL PLANS OF THE O K (ALWIN) MINE
(1968 to 1972 workings)

OK (ALWIN) MINE (No. 223, Fig. B)

By W. J. McMillan

LOCATION:	Lat. 50° 29′	Long. 121° 06′	(92I/6E)
	KAMLOOPS M.D. At an elevation of 5,100 to 5,400 feet, 3 miles west of Quiltanton Lake.		
CLAIMS:	OK (Lot 3644), APEX (Lot 3645), IOU (Lot 3643), OK 5 to 10, EZZ 13, 14, 21 to 24, PAL 1, PAL 1 to 3 Fractions, CALL 1 to 4, ALWIN 1 Fraction, FB Fraction.		
ACCESS:	Five miles of gravel road from the Highland Valley Highway, 25 miles from Ashcroft.		
OPERATOR:	OK SYNDICATE (Alwin Mining Co. Ltd., D. K Mining, Inc., and International Minerals & Chemicals Corp.), Box 699, Ashcroft.		
METALS:	Copper, silver (production shown in Table I).		

DESCRIPTION:

Alwin is a small, high-grade vein deposit. The ore zones have two dominant trends, one at north 75 degrees east to north 90 degrees east, the other at north 70 degrees west to north 55 degrees west. It is thought that the ore formed as a result of replacement along shear zones in Bethsaida granodiorite, which is a phase of the Guichon Creek batholith.

Where it is not faulted, the border of an ore zone is very sharply defined. The ore is typically emerald green in colour due to flaky sericite. The flaky sericite zone grades over a distance of about 1 millimetre to a yellowish green rock with interstitial flaky sericite, which gives way in turn 1.5 centimetres later to relatively fresh rock (Plate II). Ore minerals occur within the intensely sericitized rock but about 1 centimetre from the edge of the flaky sericiite zone sulphides decrease and the yellow-green altered zone and country rock are nearly barren.

Gangue minerals in the ore zones are primarily flaky sericite and quartz but chlorite, specularite, and calcite are common. Rarely, pyrite is associated with fine-grained sericite alteration or calcite veins. Massive epidote pods were found adjacent to ore in sublevel 4-3E. The ore minerals are chalcopyrite and bornite with minor amounts of primary chalcocite. Post-ore iron carbonate veins are common in ore zones. Approximately one million tons of ore is defined in six zones through a vertical range of 800 feet. Overall the deposits occur in a band about 500 feet wide and 1,500 feet long (Fig. 9).

Both in plan and in section, the ore zones pinch, swell, and digitate (Fig. 10). In some cases, the two dominant ore trends can be seen in one orebody and in fact in zone 3 on 4 sublevel, the ore, which has been followed along the drift at trend north 70 degrees west, splits. One part continues onward and a second part trends north 80 degrees east. In section, the digitating nature of the orebodies is illustrated by the variability of copper values both in the drifts and in drill holes.

In order to test ore trend variability within an ore zone, a strike azimuth diagram was constructed for various sublevels in zone 3 (Fig. 11). Throughout this ore zone, trends varying from north 70 degrees west to north 55 degrees west dominate; most are near north 55 degrees west. Secondary ore chutes have trend north 70 degrees east to north 90 degrees east. Locally, the ore zones horsetail causing minor northwest-trending ore chutes (502 drive west).

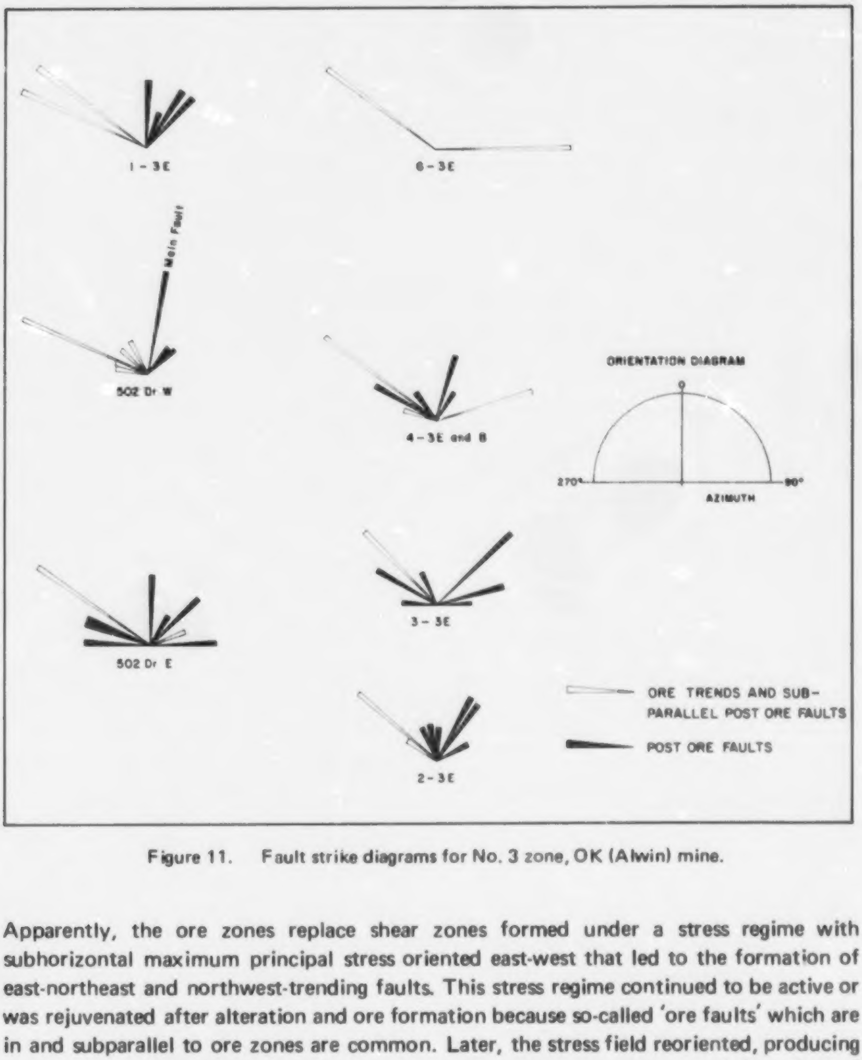

1-3E
6-3E
Main Fault
502 Dr W
4-3E and 8
ORIENTATION DIAGRAM
0
270°
90°
AZIMUTH
3-3E
502 Dr E
2-3E
ORE TRENDS AND SUB-PARALLEL POST ORE FAULTS
POST ORE FAULTS

Figure 11. Fault strike diagrams for No. 3 zone, OK (Alwin) mine.

Apparently, the ore zones replace shear zones formed under a stress regime with subhorizontal maximum principal stress oriented east-west that led to the formation of east-northeast and northwest-trending faults. This stress regime continued to be active or was rejuvenated after alteration and ore formation because so-called 'ore faults' which are in and subparallel to ore zones are common. Later, the stress field reoriented, producing north and northeast-trending faults which offset both ore zones and 'ore faults.' Movement on these faults is oblique and the orientation of slickensides suggests that the maximum principal stress was inclined 50 degrees from the horizontal up (?) toward the north. Some coarsely crystalline pyritiferous calcite veins closely post-date this faulting. Calcite grains are stress twinned and some pyrite crystals fractured during strain. The wallrock, however, is mylonite.

Quartz plagioclase porphyry dykes in the underground workings strike north and dip steeply toward the east. In the decline, and in sublevel 6-5E dykes are offset by east and east-northeast-striking 'ore faults.' Thin section analysis of dyke samples from sublevel

5-2W revealed pervasive alteration of both feldspar phenocrysts and groundmass to sericite and calcite. Relaxation of the stresses which produced pre-ore shears could cause north-south oriented tensional zones. The dykes are altered but contain little or no sulphide mineralization. They may occupy zones of tension which opened at roughly the same time the rock was infused by hydrothermal fluids which caused alteration and ore formation. It is assumed that the early shear zones were selectively replaced because of their greater permeability and chemical reactivity.

Further movement on faults may have occurred during Tertiary time when a few dykes and the small andesitic plug underlying Little OK Lake were emplaced.

WORK DONE:

Mining was started on two zones above the main haulage level by a modified long-hole method using sublevels which had been used for ore definition during the exploration phase.

When it became apparent that the dilution from this method was excessive, development was accelerated to convert to shrinkage stoping, but during the changeover sufficient mill feed could not be produced to maintain an economic operation.

All development and stope mucking were done with four Wagner ST2B scooptrams with haulage by two Jarco JDT-413 underground trucks. Ventilation was by means of an 84-inch Joy fan supplying 110,000 cubic feet per minute of air. During the year mining was taken over by the OK Syndicate from a mining contractor. At this time the decision was made to change from three portable 600 cubic feet per minute compressors to three permanently installed electric 859 cubic feet per minute compressors.

Regular operation of the concentrator began in March 1972. Production was almost entirely from the No. 2 and No. 3 zones.

The concentrator treated up to 800 tons per day but averaged about 500 tons using a single flotation circuit. Crushing equipment consists of a 24-inch by 36-inch jaw crusher and 4-foot short-head cone crusher. Electric power is supplied by four Caterpillar units with a total capacity of 1,700 kilovolt-amperes. Water and tailings were stored in a pond in front of the mill where the water was reclaimed using a floating pump. There was no discharge from the pond. Operations were suspended in December 1972.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 342, 343.

ALAMO (No. 44, Fig. B)

LOCATION: Lat. 50° 21.5' Long. 121° 00.5' (92I/6E, 7W)
KAMLOOPS M.D. At an elevation of 5,000 feet northeast of the junction of Skuhun and Skuhost Creeks, 19 miles northwest of Merritt.
CLAIMS: ALAMO, SAN JOSE, totalling 57.
ACCESS: By the Merritt-Spences Bridge Highway and Skuhun Creek road.
OWNER: SAN JACINTO EXPLORATIONS LIMITED, 3513 West 31st Avenue, Vancouver 8.
METAL: Copper.
DESCRIPTION: Malachite occurs along shallow-dipping fractures in one trench.

(92I/7)

WORK DONE: Magnetometer and electromagnetic surveys, 8.6 line-miles on the Alamo claim group.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 344; Assessment Report 3728.

SUNSHINE, LO, LEE (No. 216, Fig. B)

LOCATION: Lat. 50° 16.8'-19.7' Long. 120° 43.6'-49.2' (92I/7)
NICOLA M.D. At the headwaters of Tolman Creek, 4 miles south-southeast of Mamit Lake.

CLAIMS: SUNSHINE 1 to 16, LO 6, 7, 9 to 16, LEE 1 to 40, FRIDAY 1 to 13, ELVA 1 to 3, PATTI 1 to 10, SATURDAY 1 to 17, TRISH 1 to 8, WET 1 and 2.

ACCESS: By paved highway from Merritt, 16 miles to the south.

OWNER: HIGHLAND LODE MINES LTD., 728, 510 West Hastings Street, Vancouver 2.

METALS: Copper, silver, lead, zinc.

WORK DONE: Surface diamond drilling, six holes totalling 2,162 feet on Sunshine 1, Elva 1, and Lee 22; road construction, 2 miles on Sunshine 1 and Lee 1.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 344, 345.

FORD (No. 151, Fig. B)

LOCATION: Lat. 50° 29.5' Long. 120° 44' (92I/7)
KAMLOOPS M.D. On the north side of Meadow Creek road, 3 miles east of Logan Lake.

CLAIMS: JG 1 to 32.

ACCESS: By the Logan Lake road, 32 miles from Kamloops.

OPERATOR: NICOLA COPPER MINES LTD., 9897 – 138A Street, Surrey.

METALS: Copper, silver.

DESCRIPTION: The claims area is underlain by Nicola Group volcanic rocks. In 1929 a bluff of porphyry with disseminated copper mineralization was mined; 30 tons of ore containing 2.14 per cent copper and 0.3 ounce silver was shipped.

WORK DONE: Geochemical and electromagnetic surveys were conducted over the eastern portion of the claims during 1972.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1929, p. 228; Assessment Reports 2252 (BB), 4051.

OXBOW (No. 155, Fig. B)

LOCATION: Lat. 50° 17'-20' Long. 120° 53.5' (92I/7W)
NICOLA M.D. Two and one-half miles northeast of Tyner Lake and south of Broom Creek.

CLAIMS: OXBOW 1 to 40.

ACCESS: By walking from the Tyner Lake road, from the Chataway Lake road, or from a road leading northwesterly from near the Aberdeen mine, or by four-wheel-drive vehicle over an unimproved road which leads onto the southern half of the group.

OWNER: ROBINA EXPLORATIONS LTD., 1400, 1030 West Georgia Street, Vancouver 5.

DESCRIPTION: The claims are underlain by Chataway phase granodiorite cut by small bodies of quartz monzonite.

WORK DONE: Geochemical soil survey covering Oxbow 1-26.

REFERENCE: Assessment Report 4044.

TIL (No 226, Fig. B)

LOCATION: Lat. 50° 17.5' Long. 120° 48.5' (92I/7W)
NICOLA M.D. On Tolman Creek northeast of Lower Nicola and 1 mile east of Guichon Creek.

CLAIMS: TIL 1 to 8, 11 to 16, 19, 20, 23, and 24.

ACCESS: By road from Merritt.

OWNER: ASHCROFT RESOURCES LTD. (formerly Vastlode Mining Company Limited), 728, 510 West Hastings Street, Vancouver 2.

WORK DONE: Surface diamond drilling, one hole totalling 150 feet on Til 6.

CHATAWAY (ASELO OPTION) (No. 154, Fig. B)

LOCATION: Lat. 50° 17.5'-21' Long. 120° 48'-52.5' (92I/7W)
NICOLA M.D. The property extends from Gypsum Lake southeastward to the junction of Tolman and Guichon Creeks and eastward to Guichon Creek.

CLAIMS: The property comprises 154 located claims named WIZ, INS, SHO, REX, PAL, STA, HC, ML, ADD, LV, MYRTLE, and LG and eight Crown-granted claims including PLYMOUTH QUEEN (Lot 997) and KING SOLOMON DREAM (Lot 1254). Bethlehem Copper Corporation Ltd. has title to the HC, ML, LG, MYRTLE, some of the STA, and the Crown-granted claims; Chataway Exploration Co. Ltd. own the remainder.

ACCESS: From Merritt by the Craigmont mine road, thence by 10 miles of gravel road to the property. Access is also gained from the Mamit Lake road.

OWNERS: Chataway Exploration Co. Ltd. and Bethlehem Copper Corporation Ltd.

OPERATOR: ASELO INDUSTRIES LTD., 401, 550 Burrard Street, Vancouver 1.

METALS: Copper, molybdenum.

WORK DONE: Induced polarization survey, 15.1 line-miles covering the northern half of the property; magnetometer survey covering the southern half of the property; surface diamond drilling, two holes totalling 1,000 feet on Wiz 17 and 26 (near the south end of Twilight Lake).

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 347 (Bethlehem Copper Option); Assessment Reports 4043, 4056.

CHATAWAY (INTERNATIONAL MOGUL OPTION) (No. 46, Fig. B)

LOCATION: Lat. 50° 19.5′-23.5′ Long. 120° 52.5′-57.5′ (92I/7W)
KAMLOOPS and NICOLA M.D. On Chataway Creek, extending from Skuhun Creek to 4 miles up Chataway Creek.

CLAIMS: BOB, CAP, CECE, COE, DJ, JAY, LEN, MAB, MOON, ROS, RUM, SKY, SUN, TDM, TOM, TRISH, VAL, WIS, CAT, GLEN, MOSS, PRO, SHO, STAD, WIZ, PH, totalling 204.

ACCESS: Twenty-one miles from Merritt by the Craigmont mine road and thence by gravel road.

OWNER: Chataway Exploration Co. Ltd.

OPERATOR: INTERNATIONAL MOGUL MINES LIMITED, c/o Cordilleran Engineering Ltd., 355 Burrard Street, Vancouver 1.

METAL: Copper.

WORK DONE: Induced polarization survey, 33.1 line-miles using dipole-dipole electrode configuration and electrode intervals of variously 200, 300, or 400 feet; surface geological mapping, 1 inch equals 400 feet; trenching; stripping; surface diamond drilling, four holes totalling 1,000 feet on Jay 11, Bob 2, Moon 7, and Sky 1.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 369; Assessment Reports 3709, 4050.

CHATAWAY (CANADIAN SUPERIOR OPTION) (No. 47, Fig. B)

LOCATION: Lat. 50° 23′ Long. 120° 53.6′ (92I/7W)
KAMLOOPS and NICOLA M.D. The area drilled is northeast of Chataway Lake at 4,700 feet elevation.

CLAIMS: B, CHAT, LEN, ROB, RUSS, ROSE, TDM, WIZ, ANT, CU, DOT, GAV, HOR, LAKE, MAR, REX, totalling 150.

ACCESS: By the Chataway Lake road from Merritt, 29 miles.

OWNER: Chataway Exploration Co. Ltd.

OPERATOR: CANADIAN SUPERIOR EXPLORATION LIMITED, 5, 465 Victoria Street, Kamloops.

METAL: Copper.

DESCRIPTION: The property is underlain mainly by granodiorite of the Chataway phase of the Guichon Creek batholith.

WORK DONE: Geochemical survey covering Cu Fraction and TDM 1, 2, 5, 6, 25, and 26 during 1971 by Chataway Exploration Co. Ltd.; surface diamond drilling, two holes totalling 1,000 feet on Len 12 and Russ 8 - Chat 4 Fraction by Canadian Superior Exploration during 1972.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 347; Assessment Report 3591.

ABERDEEN (No. 110, Fig. B)

LOCATION: Lat. 50° 18.0′ Long. 120° 51.4′ (92I/7W)
NICOLA M.D. At approximately 3,400 feet elevation on the south side of Broom Creek, from 1 to 3 miles northwest of Guichon Creek.

(92I/7W)

CLAIMS: ABERDEEN (Lot 960) plus 37 CROWN located claims.
ACCESS: By the Craigmont and Chataway Lake roads from Merritt, 14 miles.
OWNER: TORWEST RESOURCES (1962) LTD., 700, 1177 West Hastings Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: The old workings are in a fine-grained version of the Guichon variety of the Guichon Creek batholith very close to the contact with the Chataway variety. The contact is west of the showings.
WORK DONE: Surface diamond drilling, six holes totalling 517 feet on Crown 5 and 6.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 346.

ROB, ORO (No. 45, Fig. B)

LOCATION: Lat. 50° 19.4'-22' Long. 120° 57'-59.4' (92I/7W)
KAMLOOPS M.D. Two miles southwest of Chataway Lake north of Skuhun Creek, 20 miles northwest of Merritt.
CLAIMS: ROB, ORO, MM, ADD, totalling 74.
ACCESS: By the Merritt-Spences Bridge Highway then 13 miles along the Chataway Lake road which follows Skuhun Creek.
OWNER: ORO MINES LTD., 707, 475 Howe Street, Vancouver 1.
METAL: Copper.
WORK DONE: Airborne magnetometer survey, approximately 65 line-miles along north-south lines 500 feet apart and airborne electromagnetic survey, approximately 65 line-miles covering all claims.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 357; Assessment Report 3633.

CAPER, CAP (No. 108, Fig. B)

LOCATION: Lat. 50° 19.6' Long. 120° 53.5' (92I/7W)
NICOLA M.D. On Broom Creek, 2 miles south of the south end of Dot Lake and 20 miles north-northwest of Merritt.
CLAIMS: CAPER 1 to 8, CAP 1 to 9, CAP Fraction.
ACCESS: By the old Aberdeen mine road and the road up Broom Creek.
OPERATORS: TOTEM URANIUMS LTD., 1009, 736 Granville Street, Vancouver 2 and SKAIST MINES LTD., c/o 713, 744 West Hastings Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: A sericitized, mineralized shear zone on the Caper 1 claim ran 9 per cent copper over 3 feet. The claims are underlain by Chataway granodiorite.
WORK DONE: Line-cutting covering 3.6 line-miles; geochemical soil survey, 170 samples.
REFERENCE: Assessment Report 3742.

MLM, GCM (No. 51, Fig. B)

LOCATION: Lat. 50° 22'-25' Long. 120° 49'-50' (92I/7W)
NICOLA and KAMLOOPS M.D. Between elevations of 3,200 and 4,400 feet on the west side of Mamit Lake.

CLAIMS: MLM, GCM, ED, DUDE, LEE, totalling 160.

ACCESS: By the Mamit Lake road from Merritt, 18 miles.

OWNER: Mamit Lake Mining Ltd.

OPERATOR: TECK CORPORATION LTD., 700, 1177 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The eastern contact of the Guichon Creek batholith crosses the property. Metavolcanic and metasedimentary rocks of the Nicola Group comprise the country rock.

WORK DONE: During the latter part of 1971 and early 1972 Mamit Lake Mining Ltd. conducted magnetometer and geochemical surveys on the Ed and Dude claims which are south of the portion of the MLM claim group surveyed previously. During 1972 Teck Corporation Ltd. carried out the following work: surface geological mapping, 1 inch equals 400 feet covering all claims; induced polarization survey, 40 line-miles covering MLM claims; geochemical soil survey, 2,112 samples covering MLM claims; surface diamond drilling, two holes totalling 620 feet on MLM 64 and 89; percussion drilling, 17 holes totalling 3,125 feet on MLM 49, 55, 69, 84, and 146 to 149.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 345; Assessment Reports 255, 594, 595, 1027, 1895, 2246, 2247, 2472, 2633, 3526, 3527, 3588, 3589, 4052, 4053, 4054.

PRICE (No. 48, Fig. B)

LOCATION: Lat. 50° 22.4'-25' Long. 120° 55.8' - 121° 00.0' (92I/7W)
KAMLOOPS M.D. At approximately 4,000 feet elevation adjacent to Roscoe Lake.

CLAIMS: PRICE, RUBY, ROSE Fraction, PETE Fraction, FRAN Fraction, JAY Fraction, totalling 85.

ACCESS: By the Highland Valley Highway then gravel road to Highmont and bush roads around Gnawed Mountain to the property.

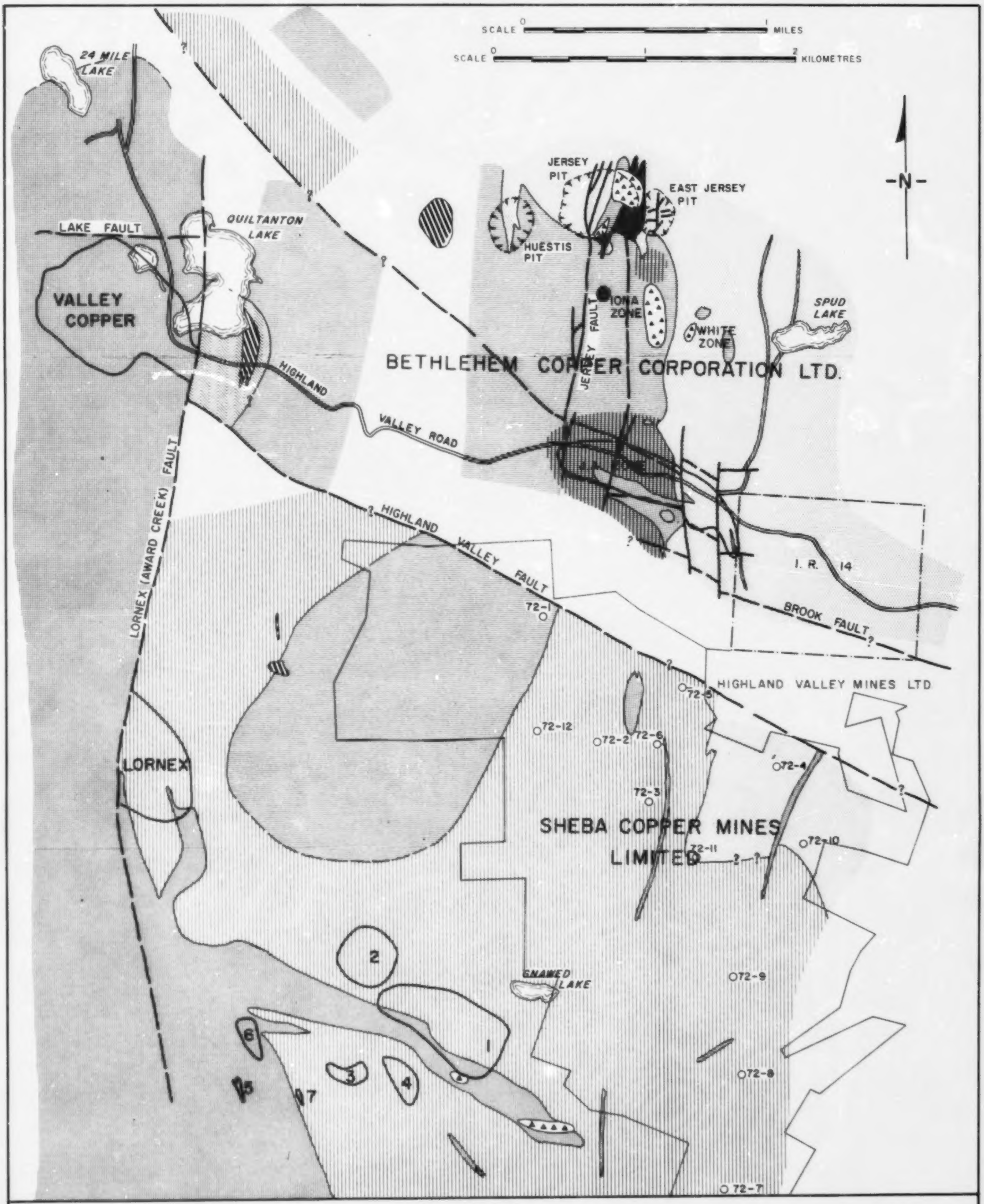
OWNER: Pathfinder Resources Ltd.

OPERATOR: HIGHMONT MINING CORP. LTD., 700, 1177 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The property is underlain by rocks of the Bethlehem and Bethsaida phases of the Guichon Creek batholith.

WORK DONE: During 1971 Pathfinder Resources Ltd. conducted geological, geochemical, and magnetometer surveys covering the northern portion of the claim group. During 1972 Highmont Mining Corp. Ltd. carried out the following work: surface geological mapping, 1 inch equals 400 feet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QUILTANTON LAKE
VALLEY COPPER
HIGHLAND VALLEY ROAD
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EAST JERSEY PIT
HUESTIS PIT
IONA ZONE
WHITE ZONE
JERSEY FAULT
SPUD LAKE
BETHLEHEM COPPER CORPORATION LTD.
HIGHLAND VALLEY FAULT
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BROOK FAULT
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72-1
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Figure 12

GENERALIZED GEOLOGY
OF
HIGHLAND VALLEY

LEGEND

TERTIARY

- ▨ VOLCANIC FLOW ROCKS
- ▨ CLASTIC SEDIMENTARY ROCKS

GUICHON CREEK BATHOLITH

- ▨ BETHSAIDA PHASE AND OFFSHOOT DYKES AND BODIES
- ▨ SKEENA VARIETY
- ▨ BETHLEHEM PHASE WITH QUARTZ EYES
- ▨ BETHLEHEM PHASE
- ☐ GUICHON VARIETY
- ▨ PORPHYRY DYKES
- ▨ BRECCIA BODIES
- OUTLINE OF OREBODY ○
- FAULT - PROVEN, INFERRED — – –

covering Price 13, 14, 23-28, and 55-58; percussion drilling, three holes totalling 725 feet on Price 25, 27, and 30.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 347; Assessment Reports 3590, 3790.

LEM (No. 49, Fig. B)

LOCATION: Lat. 50° 24.5′ Long. 120° 57′ (92I/7W)
KAMLOOPS M.D. North of Roscoe Lake and covers Deer Lake.

CLAIMS: LEM 73 to 80, LEM 11 and 12 Fractions.

ACCESS: From Ashcroft or Spences Bridge to Chataway Lodge, then along the Roscoe Lake road.

OWNER: R. B. STOKES, 713, 744 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The property is underlain by granodiorite of the Bethlehem phase of the Guichon Creek batholith, which is cut by aplite and quartz porphyry dykes.

WORK DONE: A magnetometer survey was conducted along east-west or northwest lines with 400-foot spacing. North-south and northeast tie lines were also surveyed. Readings were taken at 50-foot intervals.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 342; Assessment Report 3786.

SHEBA No. 221, Fig. B)

By W. J. McMillan

LOCATION: Lat. 50° 25′-28′ Long. 120° 57′-60′ (92I/7W)
KAMLOOPS M.D. Between 4,000 and 5,500 feet elevation mainly on east and north slopes of Gnawed Mountain.

CLAIMS: SHEBA, CU, JAY, JJ, ANN, DEE, DO, LYNN, CS, DAWN, VI, J, totalling 96.

ACCESS: By Highland Valley Highway and Highmont road from Ashcroft, 28 miles.

OWNER: Saba Copper Mines Limited (subsidiary of Sheba Copper Mines Limited).

OPERATOR: THE DOWA MINING CO., LTD., 1102, 1111 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION:

The following summary is intended to update the report in Geology, Exploration, and Mining in British Columbia, 1971. Thus only new drill results and their implications will be considered.

Drilling in 1972 was done in two periods; six holes were drilled in the spring and eight more in the fall. Only core from the first six holes has been examined by the author. The location of all 1972 drill holes is shown on Figure 12. A summary description of each hole examined is appended (*see* accompanying table).

Drilling continues to indicate weak but widespread argillic and propylitic alteration on the Sheba property. Sericitic feldspar alteration is moderately to intensely developed in several closely fractured areas. Copper mineralization replaces mafic minerals, and occurs on fractures, in quartz±epidote, pyrite-chlorite-epidote-chalcopyrite, and quartz-sericite veins. Molybdenite coats fractures and occurs in quartz or quartz-chalcopyrite veins.

Country rock in drill hole 72-4 is fine grained with some scattered medium-grained mafic phenocrysts. Despite the phenocrysts, the rock is tentatively assigned to the Guichon variety of the Highland Valley phase. As a result of this drill hole, samples from the area south and west of the hole were re-examined and renamed as Highland Valley phase. Pending more field checks, the Highland Valley phase underlying the Sheba property has not been divided on Figure 13. Distribution of the Guichon and Chataway varieties is relatively complex in this area.

SUMMARY OF 1972 DRILL HOLE DATA*

DRILL HOLE 72-1 (VERTICAL)

OVERBURDEN DEPTH: 159 feet DEPTH OF HOLE: 802 feet

VEINS: Sericite-calcite; chlorite; quartz-epidote; ocherous hematite± calcite; calcite; zeolite (below 400 feet).

MINERALIZATION: Quartz veins with chalcopyrite pods; quartz-sericite veins with chalcopyrite and bornite blebs; molybdenite in chlorite slip.

ALTERATION: Mafic minerals fresh or altered to chlorite±epidote; plagioclase variously pink to green alteration; weak overall, locally moderate.

ROCK TYPE AND GENERAL COMMENTS: Bethlehem granodiorite with 5 per cent medium-grained quartz 'eyes'; ocherous hematite veins are younger than mineralized quartz-sericite veins; many of the veins are steeply dipping (low angle to core axis).

GRADE: Sporadic weak mineralization occurs througout the hole.

DRILL HOLE 72-2 (VERTICAL)

OVERBURDEN DEPTH: 19 feet, oxide zone to 290 feet DEPTH OF HOLE: 810 feet

VEINS: Pink zeolite (0 degrees, 50 degrees) to 250 feet; calcite, quartz-chlorite-epidote; chlorite (80 degrees); quartz-epidote± ocherous hematite (0 to 30 degrees, 80 degrees).

MINERALIZATION: Chalcopyrite occurs on fractures; with pyrite replacing mafic minerals; with pyrite in chlorite-epidote veins (0 degrees); and with molybdenite in quartz veins (0 to 20 degrees). It also is disseminated or occurs as blebs in quartz-epidote veins in hornblende biotite quartz plagioclase aplite porphyry dykes.

ALTERATION: Feldspar is locally altered to pink or dark green mineral assemblages but is overall relatively fresh; mafic is variably chloritized or fresh.

ROCK TYPE AND GENERAL COMMENTS: Skeena granodiorite with quartz eyes cut by aplitic dykes.

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*Angles given are relative to the axis of the core.

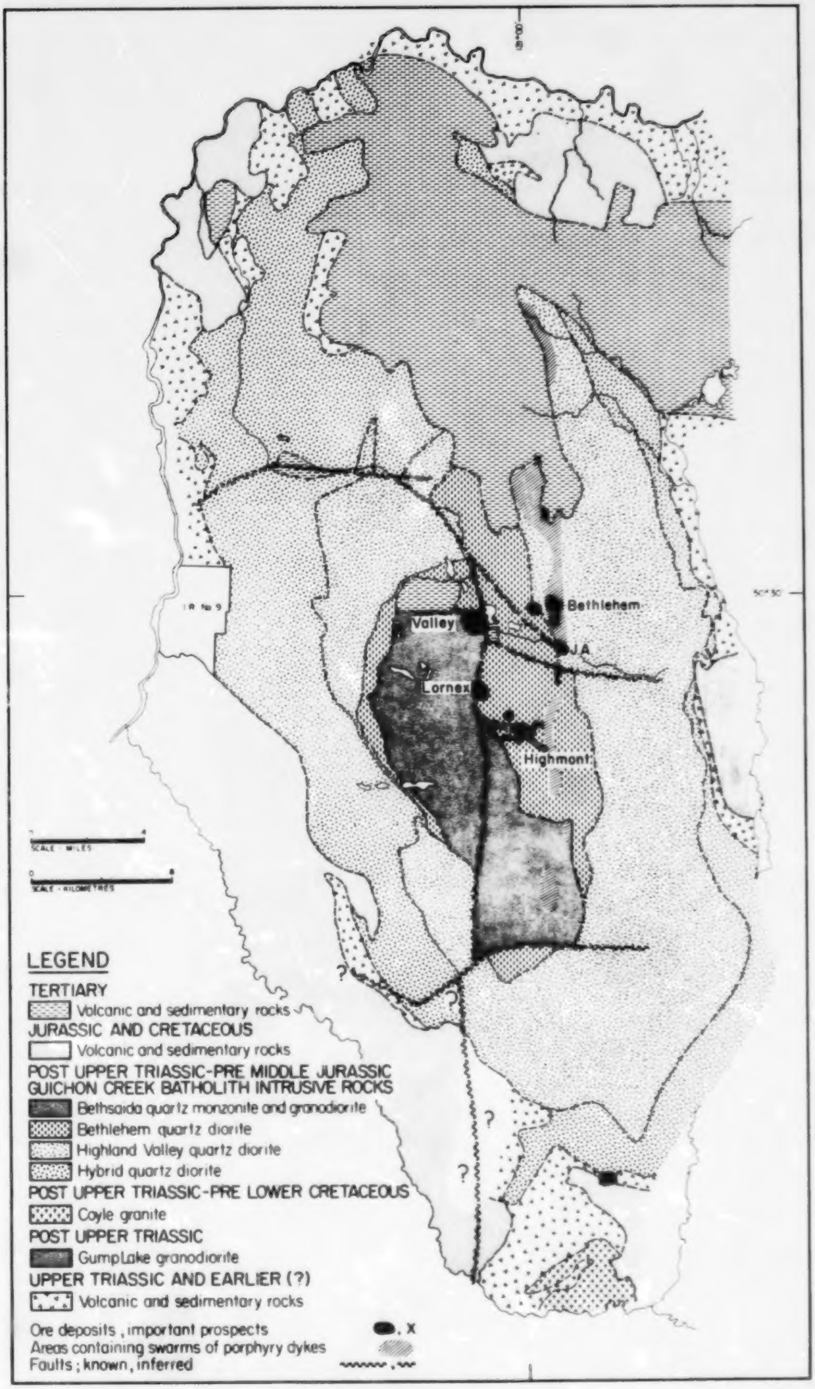

121°00'
50°30'
IR No 9
Bethlehem
Valley
JA
Lornex
Highmont
?
SCALE - MILES
0
4
SCALE - KILOMETRES
0
8
LEGEND
TERTIARY
Volcanic and sedimentary rocks
JURASSIC AND CRETACEOUS
Volcanic and sedimentary rocks
POST UPPER TRIASSIC-PRE MIDDLE JURASSIC GUICHON CREEK BATHOLITH INTRUSIVE ROCKS
Bethsaida quartz monzonite and granodiorite
Bethlehem quartz diorite
Highland Valley quartz diorite
Hybrid quartz diorite
POST UPPER TRIASSIC-PRE LOWER CRETACEOUS
Coyle granite
POST UPPER TRIASSIC
GumpLake granodiorite
UPPER TRIASSIC AND EARLIER (?)
Volcanic and sedimentary rocks
Ore deposits, important prospects
x
Areas containing swarms of porphyry dykes
Faults; known, inferred

Figure 13. Simplified geology of the Guichon Creek batholith.

GRADE: Mineralization is sporadic and weak.

DRILL HOLE 72-3 (–50 DEGREES EAST)

OVERBURDEN DEPTH: 10 feet DEPTH OF HOLE: 799 feet

VEINS: Quartz epidote (low to high); calcite±ocherous hematite (low); pink zeolite (low, 45 degrees); epidote and chlorite on fractures (low to high).

MINERALIZATION: Chalcopyrite in quartz-epidote veins; bornite in chlorite slips.

ALTERATION: Feldspar is generally fresh but has local pink altered zones adjacent to some quartz-epidote veins. A dark green feldspar alteration zone extends from 621 to 667 feet. Mafic minerals are fresh or variably chloritized generally but are variously sericitized in a zone from 590 to 660 feet. Pervasive epidotization occurs near 325 feet.

ROCK TYPE AND GENERAL COMMENTS: Skeena granodiorite with quartz eyes and local mafic-rich zones (foliation 25 to 35 degrees to core) is cut by green quartz plagioclase porphyry from 258 to 280 feet and pink biotite quartz plagioclase porphyry from 735 to 736 feet and 743 to 767 feet. Both types of porphyry have chilled contact zones. Zeolite, calcite, and quartz-epidote veins cut the green dyke.

GRADE: Sporadic weak mineralization.

DRILL HOLE 72-4 (–60 DEGREES EAST)

OVERBURDEN DEPTH: 150 feet DEPTH OF HOLE: 801 feet

VEINS: Massive, white (20 degrees) and crystalline amber calcite (35 degrees); zeolite±calcite (0 to 50 degrees); chlorite-ocherous hematite (50 degrees); quartz-epidote (0 degrees); sericite, chlorite (20 degrees, 30 degrees).

MINERALIZATION: Chalcopyrite±pyrite occurs in chlorite slips; bornite occurs in chlorite slips or replaces mafic minerals; molybdenite occurs in chlorite slips.

ALTERATION: Feldspar has local pink and green alteration zones; mafic minerals are fresh or variously altered to chlorite or sericite.

ROCK TYPE AND GENERAL COMMENTS: The country rock is fine-grained porphyritic Guichon granodiorite (Plate III). An amygdaloidal pyroxene-bearing dark grey andesite dyke occurs from 560 to 570 feet. This dyke may have been a feeder dyke during Tertiary volcanism. It is crossed by calcite veins. Pink quartz plagioclase porphyry dykes with aphanitic groundmasses were penetrated from 641 to 685 feet and 736 to 760 feet. The dykes have chilled contacts.

GRADE: Overall, mineralization is sporadic and weak but one 10-foot section (380 to 390 feet) is visually estimated to run more than 1 per cent copper.

(92H/7W)

DRILL HOLE 72-5 (–65 DEGREES EAST)

OVERBURDEN DEPTH: 35 feet, DEPTH OF HOLE: 790 feet
copper and iron oxide on fractures to end of hole.

VEINS: Pink zeolite with pink alteration halos (0 degrees, 30 degrees); calcite (20, 50, and 80 degrees); quartz-epidote±chlorite (0 to 30 degrees, 45 degrees, 80 degrees); quartz±K-feldspar (10, 50, and 70 degrees); quartz-sericite (50 degrees); chlorite, sericite (30 to 40, 70, and 90 degrees).

MINERALIZATION: Chalcopyrite replaces mafic minerals and occurs in chlorite slips; bornite occurs in quartz-epidote-chlorite veins; molybdenite in quartz veins.

ALTERATION: Feldspar has white, chalky, argillic alteration to 180 feet, then is overall relatively fresh with local pink and green alteration zones; mafic minerals are fresh, chloritized, or sericitized.

ROCK TYPE AND
GENERAL COMMENTS: Skeena granodiorite with quartz eyes cut by aplite and aplite porphyry stringers and dykes.

GRADE: Mineralization is sparse.

DRILL HOLE 72-6 (–80 DEGREES EAST)

OVERBURDEN DEPTH: 10 feet DEPTH OF HOLE: 798 feet

VEINS: Zeolite (0, 20, and 30 degrees); calcite (0 and 30 degrees); quartz-epidote (0 to 20 and 30 degrees); some have pink alteration halos; chlorite-quartz-epidote (0 and 30 to 40 degrees); chlorite, sericite (20 and 35 degrees).

MINERALIZATION: Chalcopyrite and bornite occur as blebs on fractures (30 degrees) and in quartz-epidote veins.

ALTERATION: Feldspar is relatively fresh but has local chalky argillic zones and dark green sericitic zones. Sericite alteration is moderately pervasive from 450 to 500 feet.

ROCK TYPE AND
GENERAL COMMENTS: Skeena granodiorite with quartz eyes cut by aplite stringers at moderate to high angles to core to 750 feet, then green hornblende quartz plagioclase porphyry to the end of the hole. The contact is chilled and although uneven in detail is roughly 35 degrees to core axis. Quartz-epdiote veins cut the dyke. In one sample, the dyke contains a clast of aplite. Mafic minerals in the dyke are chloritized.

GRADE: Mineralization is sparse.

WORK DONE: Surface diamond drilling, 14 holes totalling 10,072 feet on Lynn, J, Jay, Cu, Do, and Dawn.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp.348-357.

FHK (No. 109, Fig. B)

LOCATION: Lat. 50° 26' Long. 120° 48' (92I/7W)
NICOLA M.D. Approximately 2.5 miles north of Mamit Lake and straddling the Mamit Lake road.

CLAIMS: FHK 1 to 10.

ACCESS: By the Mamit Lake road from Lower Nicola, 20 miles.

OWNER: Exel Explorations Ltd.

OPERATOR: TECK CORPORATION LTD., 700, 1177 West Hastings Street, Vancouver 1.

DESCRIPTION: The property is probably underlain by the contact between the Gump Lake phase of the Guichon Creek batholith and Nicola Group volcanic rocks.

WORK DONE: Magnetometer survey, 7 line-miles and electromagnetic survey, 7 line-miles covering all claims.

REFERENCE: Assessment Report 3779.

ACB, PRICE, CN (No. 50, Fig. B)

LOCATION: Lat. 50° 26.2' Long. 120° 52.8' (92I/7W)
NICOLA and KAMLOOPS M.D. Between 4,000 and 4,500 feet elevation immediately southwest of Gump Lake and on Tupper Lake, 3 miles southeast of Indian Reserve 15.

CLAIMS: ACB 1 to 12, PRICE 39, 41 to 46, 77 to 86, 195 to 200, 505, PRICE 511, 512, 514, 518, and 520 Fractions, CN 3, JOE 1 and 2.

ACCESS: By road from Ashcroft, 36 miles.

OWNER: Oro Mines Ltd.

OPERATOR: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.

METALS: Copper, molybdenum.

DESCRIPTION: Exposed rock is mostly quartz diorite and granodiorite which are generally fresh and unaltered with poorly developed fracturing. Chalcopyrite and molybdenite are found in fractures. Bornite occurs as disseminations and in pegmatite sweats. The chalcopyrite-molybdenite mineralization is widespread but of low grade.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering ACB 1, 7-12 and Price 43-46, 79-86, 195, 197, and 518 Fraction; induced polarization survey, 13.63 line-miles covering ACB 1-12 and Price 45, 46, 81-86, 195-200 and 518 Fraction; electromagnetic survey, 5.1 line-miles covering ACB 1, 2, 10 and Price 43-46, 86; magnetometer survey, 18.1 line-miles covering ACB 1-12 and Price 43-46, 81-86, 195, 197; geochemical soil survey, 461 samples covering ACB 1, 2, 5-12 and Price 43-46, 79-86, 195, 197; geochemical silt survey, 34 samples covering ACB 10, 11 and Price 77, 79, 81, 83, 84, 195; trenching, 38 cubic yards on ACB 1 and Price 86; surface diamond drilling, two holes totalling 400 feet on Price 520 Fraction.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 347, 348; Assessment Reports 3638, 3639.

GAZA (No. 111, Fig. B)

LOCATION: Lat. 50° 26.8' Long. 120° 56.8' (92I/7W)
KAMLOOPS M.D. The property is centred 1 mile southwest of Indian Reserve 15, at elevation 4,800 feet.

CLAIMS: NAT, GAP, FARGO, BUD, totalling 37.

ACCESS: By four-wheel-drive vehicle road from the Highmont road, 2 miles.

OWNER: Gaza Mines Ltd.

OPERATOR: HIGHMONT MINING CORP. LTD., 700, 1177 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Copper mineralization occurs in sericitized granodiorite. The Gaza showing occurs along the contact between the Guichon and Chataway varieties of the Highland Valley phase.

WORK DONE: Percussion drilling, seven holes totalling 2,100 feet on Nat 1, 2, 3, and 5.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 348.

JERICHO (No. 112, Fig. B)

LOCATION: Lat. 50° 27.1' Long. 120° 54.5' (92I/7W)
KAMLOOPS M.D. Immediately south of Indian Reserve 15 and 2.5 miles north of Billy Lake.

CLAIMS: One hundred and nineteen including JERICHO, JAMES, JIM, BOB, NAT, SHEBA, HORN, DICK, BET, and J.

ACCESS: From Witches Brook road southward by dirt road, 1 mile.

OWNER: Jericho Mines Ltd.

OPERATORS: HIGHMONT MINING CORP. LTD. and TECK CORPORATION LTD., 700, 1177 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Copper mineralization occurs in shears in sericitized granodiorite in an area with numerous porphyry dykes.

WORK DONE: Induced polarization surveys, 8.8 line-miles covering Sheba 22-26, Nat 9, 11, 12, 19, 20, Bet 1 Fraction, Horn 4-6 and 17, 19, and 20 Fractions, Dick 2, James 2-4, 6, and J 34 Fraction, trenching, 1,200 feet in six trenches on Jim 3 and Jim Fraction; surface diamond drilling, two holes totalling 1,500 feet on James 3 and 4 and one hole totalling 750 feet on Bud 2 (?); percussion drilling, four holes totalling 1,200 feet on Jericho 86, Jim 3, and Bob 13 and seven holes totalling 2,000 feet on Nat and Bob.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 348.

WENDY (No. 52, Fig. B)

LOCATION: Lat. 50° 28.3' Long. 120° 50.5' (92I/7W)
KAMLOOPS M.D. At elevations of 3,500 to 4,000 feet 2 miles west of Logan Lake, south of the Highland Valley Highway.

(92I/7W)

CLAIMS: WENDY, ALLAN, COPPER, totalling 43.

ACCESS: By road from Merritt, Kamloops, or Ashcroft.

OPERATOR: FALAISE LAKE MINES LTD., 2260, 700 West Georgia Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The claims are underlain by volcanic and sedimentary rocks of the Nicola Group which have been intruded and metamorphosed by quartz diorite of the Hybrid phase of the Guichon Creek batholith. Subsequently, quartz monzonite of the Gump Lake phase of the batholith intruded both the country rock and the older quartz diorite.

WORK DONE: Bulldozer trenching, line-cutting, geological mapping, and geochemical soil sampling on Wendy 23-28, 30-34, Copper 7 Fraction, and Allan 4, 6, 8, and 2A and 2B Fractions.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 346; Assessment Reports 3699, 3727.

BETHLEHEM MINE (No. 219, Fig. B)

By E. Sadar

LOCATION: Lat. 50° 29.5' Long. 120° 59' (92I/7W)
KAMLOOPS M.D. On the north side of Highland Valley.

CLAIMS: The company holds 56 Crown-granted and 343 located mineral claims and fractions immediately east of Quiltanton (Divide) Lake.

ACCESS: By paved road south from Ashcroft, 30 miles.

OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1; mine address, Box 520, Ashcroft.

METAL: Copper (production shown in Table I).

DESCRIPTION:

As can be seen on Figure 12 ore zones at Bethlehem Copper occur at or near the contact between rocks of the Guichon variety and the younger Bethlehem phase of the Guichon Creek batholith. Mineralization is best developed in shattered and brecciated zones. These closely fractured areas are associated with faults, occur in the older Guichon variety rocks near digitations in the Bethlehem phase contact, and are associated with breccia bodies. The breccias apparently formed as a result of degassing during crystallization of pre-ore porphyry dykes (Carr, 1960).

WORK DONE:

The mine is presently working on a three-shift basis with production coming from the Huestis and to a lesser extent the Jersey pits.

Major equipment in service includes twenty-three Haulpak 50-ton trucks, three 88-B Bucyrus-Erie shovels, three 475 Michigan loaders, two 45-R rotary drills, three D-8 tractor bulldozers, and two road graders.

Mill capacity averaged 16,000 tons per day. The entire production is trucked to Clinton and shipped from this point by rail to wharves in North Vancouver for eventual shipment to Japan.

During 1972 exploratory investigations were directed toward the development of the J-A orebody.

Two large pebble mills were installed in 1972 for finer grinding of the ore and improved copper recoveries.

Although no housing is available at the minesite, townhouses and apartment units are provided for employees in Ashcroft and most employees commute from there.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 357; Carr, J. M. (1960), Porphyries, Breccias, and Copper Mineralization in the Highland Valley, B.C., *Can. Min. Jour.*, pp. 71-73.

J-A (No. 220, Fig. B)

By W. J. McMillan

LOCATION: Lat. 50° 28.5' Long. 120° 58.5' (92I/7W)
KAMLOOPS M.D. In the Highland Valley, 1 mile southeast of the Bethlehem mine.

CLAIMS: The company holds 56 Crown-granted and 343 located mineral claims and fractions north and east of Quiltanton (Divide) Lake.

ACCESS: By paved road from Ashcroft, 30 miles.

OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION:

INTRODUCTION AND ACKNOWLEDGMENTS: The following preliminary report on the J-A deposit is based primarily on data gathered during a two-week period spent scanning core from more than 100 drill holes. It is supplemented by published data from technical newspapers and enhanced by discussions with geologists supervising the exploration programmes. Thanks are extended in particular to P. Tsaparas and J. Bellamy for their help. The management of Bethlehem Copper Corporation Ltd. are thanked for their cooperation. More careful core examination of selected holes is planned during 1973 and will provide the basis for a more detailed future report.

The J-A deposit, named in honour of Mr. J. A. McLallen, Chairman of Bethlehem Copper Corporation Ltd., was discovered in the summer of 1971. Subsequently, more than 100 drill holes have probed and outlined the new find. Deep overburden posed problems for drilling early in the exploration programme but these were overcome to a large extent by using rotary drills to reach bedrock, then diamond drills to penetrate it.

A preliminary open pit described in the company's 1972 annual report has been designed to extract 125 to 150 million tons of material from the deposit with grade 0.60 to 0.65 per cent copper equivalent and stripping ratio 2.5:1. Reserves estimated for the deposit are more than 300 million tons at 0.45 per cent copper equivalent.

OVERBURDEN IN HIGHLAND VALLEY: In the vicinity of the J-A deposit, preglacial material in Highland Valley is apparently thin and discontinuous. Glacial deposits, however, infill the valley to depths in excess of 1,000 feet locally and in the vicinity of the deposit overburden depth averages 550 feet. Because three or possibly four major glaciations influenced the glacial deposits, Pleistocene stratigraphy is complex. In a general way, however, the valley is infilled by a thin discontinuous basal sand, gravel, and till succession which is overlain by a thick sequence of thin-bedded lacustrine silts, silty sands, and clayey silts, then a moderately thick, well to poorly bedded silt, sand, and

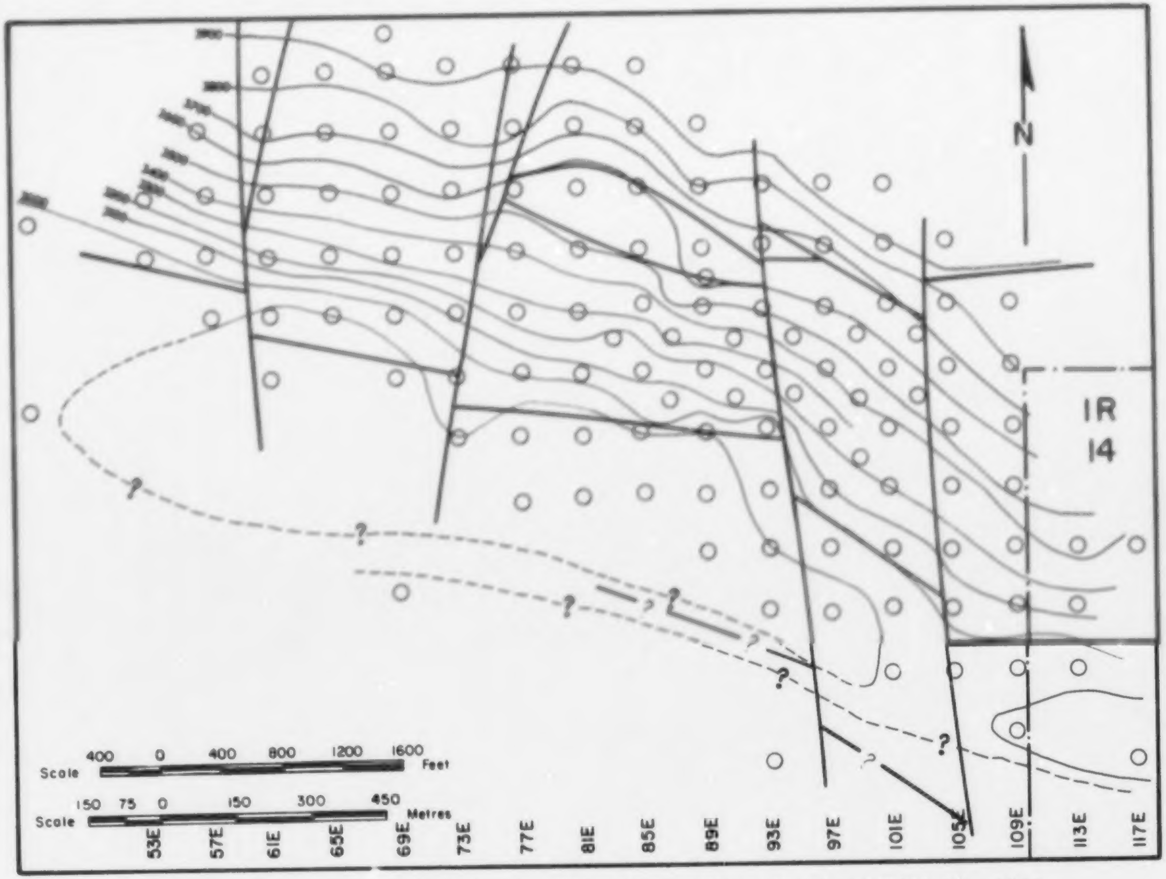

N
IR
14
Scale
400 0 400 800 1200 1600
Feet
Scale
150 75 0 150 300 450
Metres
53E
57E
61E
65E
69E
73E
77E
81E
85E
89E
93E
97E
101E
105E
109E
113E
117E
?

Figure 14. Contour map of the bedrock surface of the J-A mineral deposit, based on drill-hole information.

gravel succession in which depressions and erosional channels are filled by deltaic outwash sediments. The valley walls are veneered by ablation moraines, bedded silt, sand, and gravel. Kettle lakes occur in the valley (Quiltanton, Little Divide Lakes). Eskers and numerous kame terraces which subparallel contours occur along the walls of the valley. These formed along the margins of the body of ice which filled Highland Valley. Successive levels of kame terrace formation indicate downward wasting of the ice.

TECTONIC SETTING: Regional mapping as well as drill information near Quiltanton Lake and in the vicinity of the lower, middle, and upper tailings damsites further west suggest that a series of *en echelon* grabens formed the Highland Valley trough (Fig. 13). The distribution of Tertiary volcanic and sedimentary rocks discovered by the drilling further suggests that the rifting occurred or was reactivated during Tertiary time in at least two periods, Eocene and Oligocene times (McMillan, 1970, p. 363).

A contour map of the bedrock topography based on J-A drill holes (Fig. 14) shows steeply inclined valley walls and a virtually level valley bottom. Thus the bedrock surface strongly suggests that the graben system extends eastward at least as far as Indian Reserve 14. The contour patterns further suggest that the easterly striking normal faults of the graben were offset and rotated by northerly striking faults (Fig. 15). Little data is available to position the southern bounding fault of the graben. Irregularities in the slope of the bedrock surface underlying the north wall of the valley suggest the presence of other easterly striking faults. Such faults were predicted from regional mapping. (Fig. 13). Similarly, north-striking faults with right lateral offset are in keeping with the regional tectonic framework.

GEOLOGICAL INTERPRETATION: The interpretation presented herein (Fig. 15) is probably a fair representation of the gross geologic setting of the J-A deposit. In detail, it is subject to error because drill core was examined rapidly, because most holes are 400 feet apart and all are vertical, and because the fault pattern inferred may be incorrect.

A small stock (?) of quartz plagioclase porphyry which is elliptical in outline and is elongated east-southeastward forms the core of the J-A deposit (Fig. 15). This stock intrudes the contact between granodiorites of the Guichon and Bethlehem phases of the Guichon Creek batholith which trends southward across the deposit.

Adjacent to the porphyry stock, the Bethlehem phase is characterized by medium to coarse-grained, subhedral quartz phenocrysts. In the northernmost drill holes, these phenocrysts do not appear and the rock texture is more typical of the Bethlehem phase. It is possible that the quartz phenocrysts near the stock are of metasomatic origin.

Rocks of the Guichon variety have typical textures near the stock. In the southeast part of the property, intercalated finer grained zones and local areas of Chataway variety occur. The fine-grained and Chataway zones grade into normal Guichon. Here they apparently represent textural variations within the Guichon variety.

Mineralization occurs both in the stock and the older rocks but the central part of the stock which is virtually barren is partially mantled to the north by better than average mineralization. This better grade mineralization also encloses and may be influenced by the Guichon/Bethlehem contact. The deposit as a whole is elongated east-southeastward as is the stock. Much of the mineralization encloses or lies north of the stock in the north wall of the graben. It is possible that better grade mineralization such as that found north of the barren zone in the centre of the stock will be found at depth. Cross-sections (Fig.

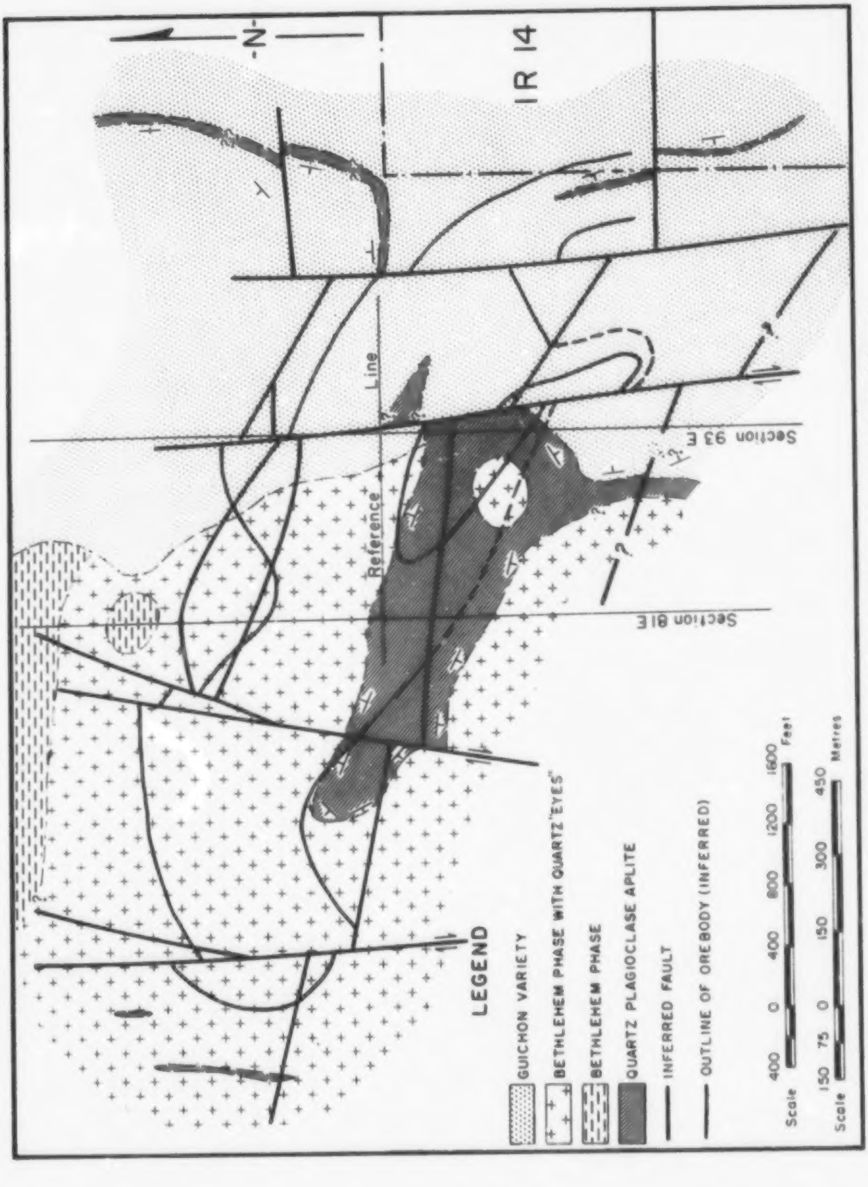

-N-
IR 14
Reference Line
Section 93 E
Section 81E
?
LEGEND
GUICHON VARIETY
BETHLEHEM PHASE WITH QUARTZ "EYES"
BETHLEHEM PHASE
QUARTZ PLAGIOCLASE APLITE
INFERRED FAULT
OUTLINE OF OREBODY (INFERRED)
Scale 400 0 400 800 1200 1600 Feet
Scale 150 75 0 150 300 450 Metres

Figure 15. Inferred bedrock geology of the J-A mineral deposit.

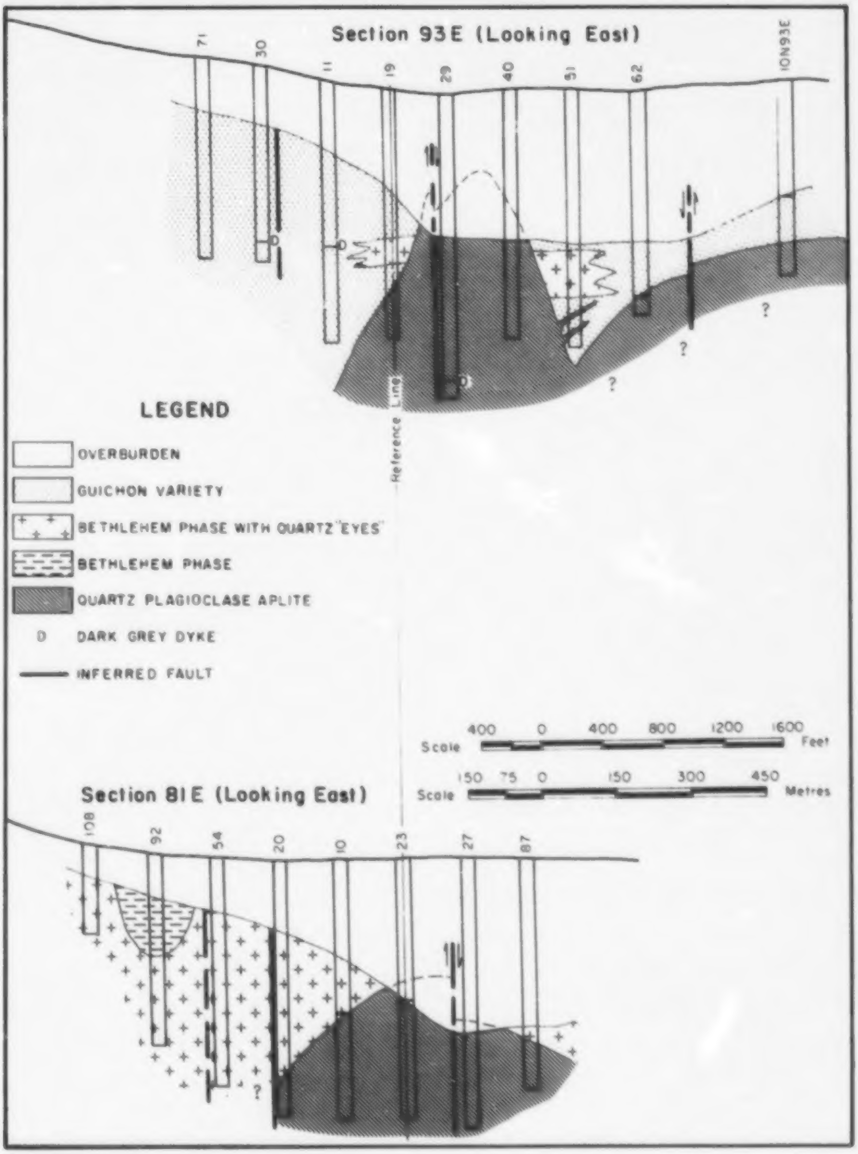

Section 93E (Looking East)
71
30
11
19
29
40
51
62
10N93E
D
?
?
?
?
Reference Line
LEGEND
OVERBURDEN
GUICHON VARIETY
BETHLEHEM PHASE WITH QUARTZ "EYES"
BETHLEHEM PHASE
QUARTZ PLAGIOCLASE APLITE
D DARK GREY DYKE
INFERRED FAULT
Scale 400 0 400 800 1200 1600 Feet
Scale 150 75 0 150 300 450 Metres
Section 81E (Looking East)
108
92
54
20
10
23
27
87
?

Figure 16. Geological cross-sections of the J-A mineral deposit.

16) suggest vertical offset in the order of 200 to 500 feet occurred on the 'Brook' fault.

Mafic quartz plagioclase porphyry dykes cut Guichon and Bethlehem country rock. It is not clear whether they cut the porphyry stock but some appear to be offshoots from the stock. Two types of porphyry dyke are common. One type has an aphanitic groundmass, the other has an aplitic matrix. No cutting relationships were seen between the dyke types but both have more or less chilled contacts against Bethlehem and Guichon (Plate III). Some are poorly to well mineralized; some are nearly barren.

Dark grey dykes intrude Guichon, Bethlehem, and the porphyry stock. These dykes are generally a few feet wide and are apparently discontinuous. They are generally speckled with black mafic crystals and are locally amygdaloidal. Calcite composes amygdules and forms veins but no sulphide mineralization was noted in any of these dykes. They look like many of the Tertiary basaltic andesite flows of the Kamloops Group. However, it is possible that they were intruded during Lower Cretaceous time, at the same time as lamprophyre dykes intruded the Valley Copper deposit (Jones and Allen, 1972, p. 557).

ALTERATION: Feldspar alteration in the J-A deposit is similar to that in other Highland Valley deposits. That is, feldspar colour ranges from white to shades of green or to pink. By inference with other deposits, the white colour represents argillic alteration; the green very fine sericite and calcite; and the pink also very fine sericite and calcite. The pink colour in sericite-calcite alteration zones may result from very fine, disseminated hematite. Mafic minerals are typically chloritized and locally epidotized.

MINERALOGY: Chalcopyrite, bornite, and molybdenite are the economically significant minerals but pyrite also occurs through much of the deposit. According to Bethlehem geologists, the bornite/chalcopyrite ratio is 1:5. Mineralization occurs as fracture coatings, in veins disseminated in altered zones, and replacing mafic minerals. Gangue minerals on fractures and in veins are quartz, epidote, sericite, and chlorite. Post-ore veins include calcite, zeolite, and gypsum.

ZONING OF ALTERATION: In a sense, the central porphyry stock could be regarded as the potassic zone and a poorly mineralized zone in the stock certainly forms a 'barren core' to the deposit. Around this 'barren core' Bethlehem geologists have recognized chlorite-sericite (phyllic) then chlorite-epidote (propylitic) zones which partially enclose the 'core.'

Because of the nature of the logging done by the author, relative abundances of minerals were not determined. However, Figure 17 indicates the distribution of pyrite and epidote with no regard for abundance. Bethlehem geologists indicate that epidote is sparse but chlorite and sericite are prominent in zones of better grade mineralization.

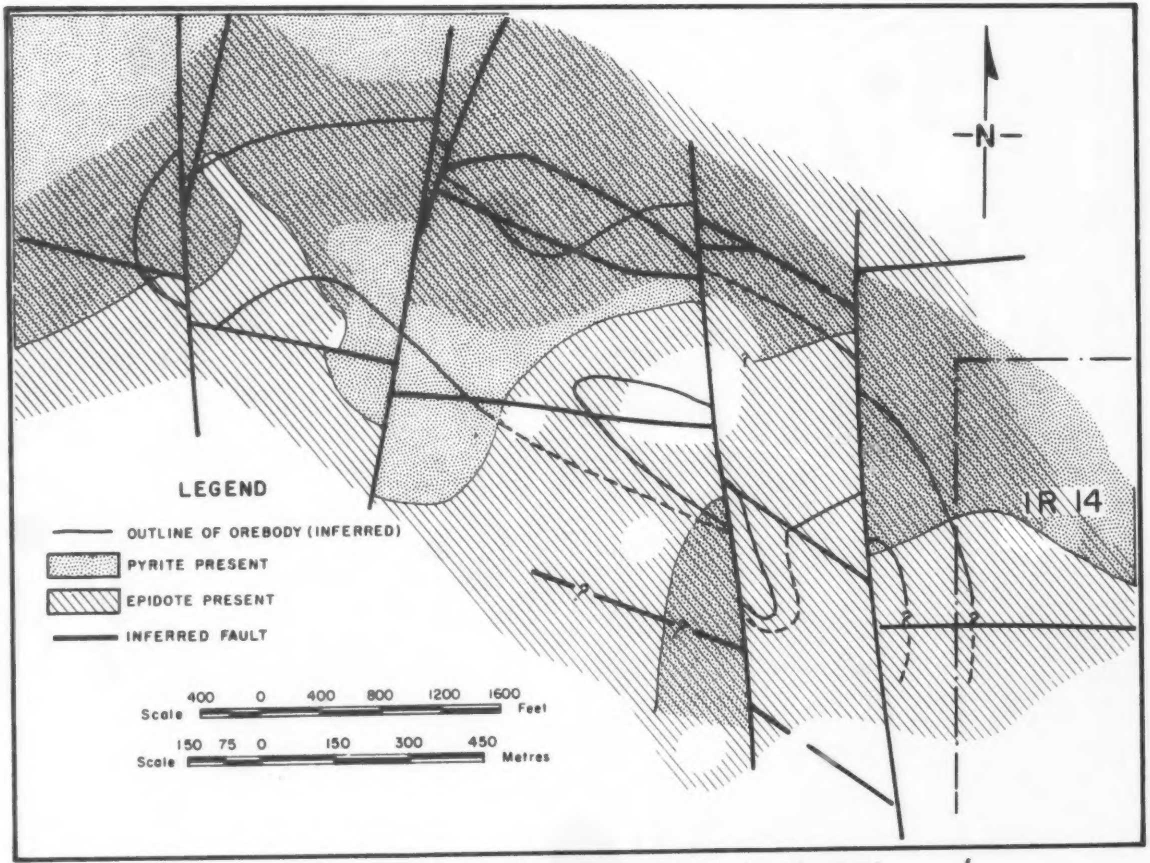

N
IR 14
LEGEND
OUTLINE OF OREBODY (INFERRED)
PYRITE PRESENT
EPIDOTE PRESENT
INFERRED FAULT
Scale 400 0 400 800 1200 1600 Feet
Scale 150 75 0 150 300 450 Metres
?

Figure 17. Distribution of pyrite and epidote in the J-A mineral deposit. Note that the data have been fit to the proposed fault distribution pattern of the deposit.

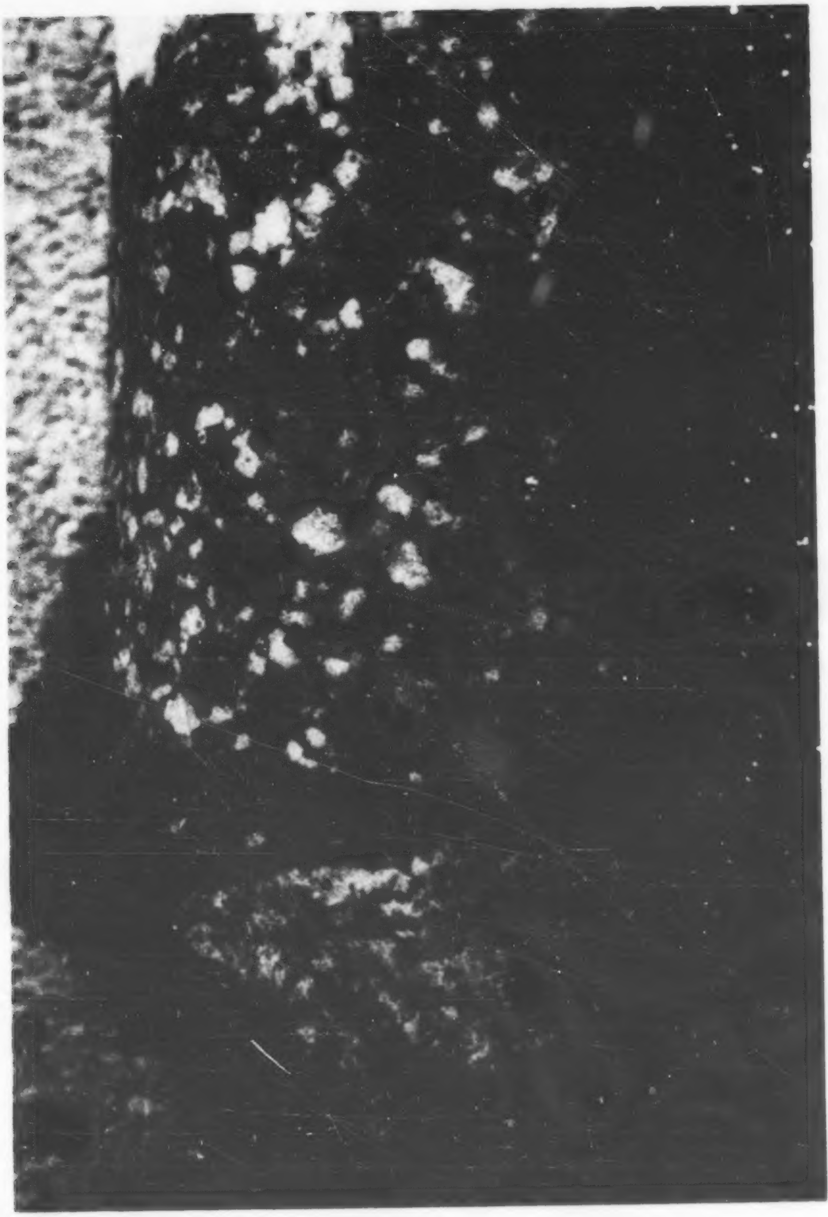


Plate III. NQ diamond-drill core showing contact of porphyry dyke chilled against Guichon granodiorite in drill hole V-72-60 in JA orebody.

SUMMARY: The J-A deposit occurs in and adjacent to a quartz plagioclase aplite stock which intruded rocks of the Guichon variety and Bethlehem phase of the Guichon Creek batholith. Adjacent to the stock quartz phenocrysts occur in the Bethlehem phase but the Guichon variety is texturally unchanged. Porphyry dykes which may be derived from the stock and younger dark grey dykes occur. Some of the porphyry dykes are mineralized. Chalcopyrite, bornite, and molybdenite coat fractures or form veins with quartz, epidote, chlorite, and sericite. Chalcopyrite and bornite also replace mafic minerals.

The deposit may have a potassic central alteration zone with partially enclosing phyllic and propylitic alteration zones. It has a 'barren core' within the aplite stock south of a zone of better-than-average grade mineralization. Insufficient drill data combined with probable post-ore faulting obscure the picture south of the stock.

The contoured bedrock surface, as well as regional mapping, suggest that the Highland Valley is a graben. In the area of the J-A deposit, the easterly trending normal faults appear to be offset by northerly trending faults with right lateral offset. The stock and the zone of mineralization are oriented east-southeast parallel to the graben faults. Inferred north-trending faults are parallel to regional faults which were active during Mesozoic time and to dyke swarms to the north and south. They appear to offset mineralized zones. It appears that both the northerly and easterly regional tectonic fabrics are pre-ore. Post-ore movement on both sets of faults may have occurred during Middle Jurassic time when sedimentary basins were formed in the west, or during Cretaceous time in response to volcanic activity in the south and southwest parts of the batholith. However, deposits found by drilling elsewhere in Highland Valley suggest graben formation took place during Tertiary time.

WORK DONE: Exploratory drilling amounted to 148,000 feet on NQ wireline drilling distributed through 111 vertical holes. The deposit was drilled on a grid pattern with holes spaced on 400-foot centres. Ground water and preliminary feasibility studies were conducted.

REFERENCES: Jones, M. B. and Allen, J. M. (1972), Hydrothermal alteration and mineralization, Valley Copper deposit, B.C., *Geol. Soc. Amer.*, Abstracts, Vol. 4, p. 557; McMillan, W. J. (1970), Valley Copper, *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, pp. 354-369; 1971, p. 357 (Bethlehem mine).

XY (No. 212, Fig. B)

LOCATION: Lat. 50° 30.2′ Long. 120° 52′ (92I/7W, 10W)
KAMLOOPS M.D. On the west side of Guichon Creek, 4 miles east of the Bethlehem mine.

CLAIMS: XY 1 to 28.

ACCESS: By the North Pacific JB road which branches off the Tunkwa Lake road 2 miles north of the Four Corners.

OWNER: COMET INDUSTRIES LTD., 2502, 1177 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Much of the property is underlain by granodiorite of the Guichon variety of the Guichon Creek batholith. However, the contact with quartz diorites of the Hybrid phase may cross the eastern part of the claim group. The company geologist reports disseminated pyrite and chalcopyrite associated with altered zones in the Guichon granodiorite.

WORK DONE: Nine line-miles of reconnaissance induced polarization survey and a geological survey. Lines are north-south and 400 feet apart.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 358; Assessment Report 4114.

KR&K (CHARTRAND) (No. 53, Fig. B)

LOCATION: Lat. 50° 29′-30.5′ Long. 120° 48′-50′ (92I/7W, 10W)
KAMLOOPS M.D. On Chartrand Creek between the Four Corners and Logan Lake townsite.

CLAIMS: KR&K 1 to 38.

ACCESS: By road from Savona, 22 miles.

OWNER: NICOLA COPPER MINES LTD., 9897 – 138A Street, Surrey.

DESCRIPTION: The claims are overburden covered but lie near the eastern contact of the Guichon Creek batholith.

WORK DONE: A magnetometer survey was done on KR&K 1, 17, 21, and 31. Readings were taken at 100-foot intervals along northwest-southeast lines 300 feet apart.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 259; Assessment Report 3553.

OLD ALAMEADA, LAST CHANCE (No. 184, Fig. B)

LOCATION: Lat. 50° 17′-19′ Long. 120° 39′-42.5′ (92I/7E)
NICOLA M.D. At approximately 5,500 feet elevation on Swakum Mountain, 13 miles north-northeast of Merritt.

(92I/7E)

CLAIMS: LO 3 to 12, AMIGO 1, 6, 8, 9 to 21, 23, 25, 27, 29, 32, 34, 36, 38, 40, 42 to 73, Mineral Leases M-27 and M-28 (OLD ALAMEADA, OLD ALAMEADA 1 to 9, Lots 4507, 4506, 4508, 4505, 4504, 4503, 4501, 4891, 4895, 4896 respectively).

ACCESS: By gravel road from Nicola, 15 miles.

OWNER: ADAR RESOURCES LTD., 330, 890 West Pender Street, Vancouver 1.

METALS: Copper, lead, zinc, gold, silver, tungsten.

DESCRIPTION: Nicola Group rocks are intruded by igneous rocks varying from granite to diorite.

WORK DONE: Magnetometer survey, 5 line-miles; electromagnetic survey, 10 line-miles; geochemical soil survey, 10 samples covering LO 3 and 4 and Mineral Lease M-28; surface diamond drilling, two holes totalling 1,000 feet on LO 3 and Mineral Lease M-28; percussion drilling, one hole totalling 120 feet on LO 3.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1959, pp. 36-38; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 270; 1971, p. 294 (Last Chance); *Geol. Surv., Canada,* Mem. 249, pp. 62-64 137-143; Assessment Reports 136, 1795, 3936.

REY (No. 149, Fig. B)

LOCATION: Lat. 50° 19'-21.5' Long. 120° 40.5'-44' (92I/7E)
NICOLA M.D. The property is centred on Rey Lake, 5 miles southeast of Mamit Lake at an approximately elevation of 4,400 feet.

CLAIMS: REY, totalling 132.

ACCESS: From Merritt by the Mamit Lake road then by road up Rey Creek, 23 miles.

OWNER: AMERICAN SMELTING AND REFINING COMPANY, 504, 535 Thurlow Street, Vancouver 5.

METALS: Copper, molybdenum.

DESCRIPTION: Fracture zones in Nicola Group volcanic rocks contain copper and molybdenum sulphides.

WORK DONE: Claims mapped (partially); surface geological mapping, 1 inch equals 200 feet covering most claims; magnetometer survey, 10.2 line-miles; electromagnetic survey, 12 line-miles; and induced polarization survey, 5.2 line-miles covering Rey 201-210, 216, 218, 220-226, 235, and 236; geochemical soil survey, 106 samples covering Rey 205-210 and 214-227; road construction, 5.5 miles (south and east of Rey Lake); trenching, 950 feet on Rey 206 and 207; surface diamond drilling, six holes totalling 3,223 feet on Rey 206, 207, 208, and 218; percussion drilling 47 holes totalling 9,885 feet.

EL-RIO, VEGA (No. 57, Fig. B)

LOCATION: Lat. 50° 22.5'-23.5' Long. 120° 35'-41.5' (92I/7E)
NICOLA M.D. At approximately 4,800 feet elevation in the vicinity

of Surrey and Sussex Lakes, 7 miles east of Mamit Lake.

CLAIMS: EL-RIO 1 to 22, VEGA 1 to 26, FARGO 1 to 10, VERA 1 to 4, EAGLE 1 to 22.

ACCESS: By the Logan Lake road from Kamloops, 36 miles.

OWNERS: LARGO MINES LTD. and ARLINGTON SILVER MINES LTD., 1110, 505 Burrard Street, Vancouver 1.

DESCRIPTION: Much of the property is underlain by volcanic rocks of the Triassic Nicola Group. The Fargo claims which form the eastern part of the property are also underlain by metamorphic and granitic rocks of the Nicola batholith.

WORK DONE: Geochemical soil survey, 2,000 samples covering El-Rio, Vega, Fargo, and Eagle claims.

REFERENCE: Assessment Report 3894.

DES (No. 150, Fig. B)

LOCATION: Lat. 50° 23.5'-26.5' Long. 120° 36'-40' (92I/7E)
KAMLOOPS and NICOLA M.D. At 4,000 to 5,000 feet elevation west and south of Desmond Lake, 8 miles east-northeast of Mamit Lake.

CLAIMS: DES 1 to 98.

ACCESS: By the Lac Le Jeune-Meadow Creek road, thence southerly by the four-wheel-drive vehicle Surrey Lake fishing camp road.

OWNER: NEWCO VENTURES LTD., 5325 Buckingham Avenue, North Burnaby.

DESCRIPTION: The property is underlain by basic to intermediate Nicola Group volcanic rocks which are locally intruded by monzonite bodies and latite dykes. The volcanic rocks are amygdaloidal to porphyritic and are locally sheared or foliated. They contain quartz, epidote, and calcite veinlets. Adjacent to the monzonite the volcanic rocks are weakly hornfelsed and pyritized. Both the monzonite and country rock contain trace amounts of chalcopyrite.

WORK DONE: Several shallow Caterpillar trenches and several X-ray drill holes (probably during the late 1950's); preliminary geological examination and geochemical soil survey, approximately 1,130 analyses having been made.

REFERENCE: Assessment Report 4057.

RAM (No. 217, Fig. B)

LOCATION: Lat. 50° 26' Long. 120° 34.5' (92I/7E)
KAMLOOPS M.D. Between 4,200 and 6,000 feet elevation 4 miles southwest of Lac Le Jeune.

CLAIMS: RAM 1 to 18.

ACCESS: By logging road from Lac Le Jeune, 4 miles.

OWNER: RIO SIERRA DEVELOPMENTS LTD., c/o 1001, 1011 Beach Avenue, Vancouver 5.

(92I/7E)

DESCRIPTION: According to Geological Survey of Canada Map 886A the property is underlain mainly by rocks of the Triassic Nicola Group. The eastern part of the claims may be underlain by rocks of the Nicola batholith.

WORK DONE: Magnetometer and geochemical soil surveys.

REFERENCE: Assessment Report 4222.

PLUG (No. 147, Fig. B)

LOCATION: Lat. 50° 26.6' Long. 120° 36.2' (92I/7E)
KAMLOOPS M.D. At approximately 4,000 feet elevation extending from Desmond Lake to the head of Melba Creek, 6 miles west of Lac Le Jeune.

CLAIMS: PLUG 1 to 86.

ACCESS: By the Logan Lake road then the Surrey Lake road, 1 mile.

OPERATOR: TEXADA MINES LTD., 407, 1111 West Georgia Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: The claims are drift covered; from the few outcrops they are underlain by metamorphosed Nicola Group volcanic rocks cut by small granitic plugs and sills. The volcanic rocks have been altered along faults to a quartz-mariposite-carbonate rock. Pyrite-chalcopyrite mineralization occurs in a small intrusion of quartz feldspar porphyry.

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 400 feet covering all claims; induced polarization survey, 14.5 line-miles and magnetometer survey, 14.5 line-miles covering Plug 3, 4, 7-10, 13, 14, 17-30, 72-76; geochemical survey, 268 samples covering same claims as induced polarization and magnetometer surveys; road construction, 1 mile (for drill access); percussion drilling, eight holes totalling 1,400 feet on Plug 7-10, 25, and 74.

REFERENCES: Assessment Reports 4041, 4042.

BERTHA and MOLLY (No. 55, Fig. B)

LOCATION: Lat. 50° 26.5'-28' Long. 120° 40'-43.5' (92I/7E)
KAMLOOPS and NICOLA M.A. Between 4,500 and 4,800 feet elevation surrounding Homfray and Dupont Lakes.

CLAIMS: JHC 1 to 26, JHC 19, 21, 27 to 29 Fractions, CB 1 to 14, BC 1 to 12, GJ 23 to 28, JIG 1 to 22, JIG 29 to 40.

ACCESS: By road from Kamloops, 25 miles.

OWNERS: HIGHHAWK MINES LIMITED and CONSOLIDATED STANDARD MINES LIMITED, 333, 885 Dunsmuir Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The claims are underlain in whole or part by rocks of the Nicola Group of Upper Triassic age, with minor sedimentary beds.

WORK DONE: Induced polarization survey, 16.36 line-miles covering Jig 1-16, 33-40, and GJ 23-28; geochemical soil survey, 640 samples covering Jig claims; surface diamond drilling, two holes totalling 750 feet on Jig 9 and 38.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1930, p. 195; 1959, p. 38 (Vanex); *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, pp. 294, 295; *Geol. Surv., Canada,* Mem. 249, p. 126; Assessment Reports 228, 265, 266, 3668, 3763, 3764.

KR&K (GREENSTONE) (No. 218, Fig. B)

LOCATION: Lat. 50° 27.5'-29' Long. 120° 39.5'-43' (92I/7E)
KAMLOOPS M.D. At 3,400 feet elevation on Meadow Creek near Greenstone Creek.
CLAIMS: KR&K 58 to 65, 67, 69, 71, 73, 149 to 162, 200 to 213, 317, 318.
ACCESS: By road from Kamloops, approximately 25 miles.
OWNER: NICOLA COPPER MINES LTD., 9897 – 138A Street, Surrey.
DESCRIPTION: The claims are underlain by dark green andesitic volcanic rocks of the Triassic Nicola Group.
WORK DONE: Electromagnetic and geochemical surveys over KR&K 58, 59, 212, and 213.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 324; Assessment Reports 4046, 4047.

WES (No. 148, Fig. B)

LOCATION: Lat. 50° 28' Long. 120° 36' (92I/7E)
KAMLOOPS M.D. At approximately 4,000 feet elevation between Hay Brook and Neal Creek, 4 miles west of Lac Le Jeune.
CLAIMS: WES 57 to 74.
ACCESS: By the Logan Lake road from Lac Le Jeune, 4 miles.
OWNER: BART MINES LTD., 710, 475 Howe Street, Vancouver 1.
DESCRIPTION: The property is underlain by rocks of the Triassic Nicola Group.
WORK DONE: Surface geological mapping; magnetometer survey, 20 line-miles; and geochemical soil survey, 1,000 samples covering all claims.

MR (No. 56, Fig. B)

LOCATION: Lat. 50° 28.5' Long. 120° 35.8' (92I/7E)
KAMLOOPS M.D. At 4,000 to 4,500 feet elevation north of Melba Creek, 4 miles west of Walloper Lake and 18 miles southwest of Kamloops.
CLAIMS: MR 1 to 10.
ACCESS: By Highway 1 and the Lac Le Jeune road from Kamloops.
OPERATORS: M. A. ROED, 2205 West Keith Road, North Vancouver and STELLAKO MINING CO. LTD., 3039 Granville Street, Vancouver 9.
WORK DONE: Magnetometer survey.
REFERENCE: Assessment Report 3897.

HW, COL (No. 54, Fig. B)

LOCATION: Lat. 50° 29' Long. 120° 44' (92I/7E)
KAMLOOPS M.D. On Meadow Creek, 3 miles east of Logan Lake.

CLAIMS: HW, COL, totalling 11.

ACCESS: By the Logan Lake road from Kamloops, 32 miles.

OWNER: H. W. WIGGINS, General Delivery, Logan Lake.

WORK DONE: Magnetometer survey covering 5.4 line-miles.

REFERENCES: Assessment Reports 2252 (BB), 3778.

MANDY (No. 156, Fig. B)

LOCATION: Lat. 50° 27.5' Long. 120° 30' (92I/7E, 8W)
KAMLOOPS M.D. One mile south of the west end of Lac Le Jeune.

CLAIMS: MANDY 1 to 12.

ACCESS: By the Lac Le Jeune road from Merritt, Kamloops, or Ashcroft.

OWNER: NICOLA COPPER MINES LTD., 9897 – 138A Street, Surrey.

DESCRIPTION: The property is underlain by rocks of the Nicola batholith.

WORK DONE: Electromagnetic and geochemical surveys on Mandy 9 and 11.

REFERENCE: Assessment Report 4049.

WT (No. 152, Fig. B)

LOCATION: Lat. 50° 30' Long. 120° 33.5' (92I/7E, 10E)
KAMLOOPS M.D. At approximately 4,700 feet elevation 3 miles west-northwest of Lac Le Jeune.

CLAIMS: WT 35 to 44, 51 to 60.

ACCESS: From Kamloops by the Logan Lake road which crosses the southern end of the property.

OWNER: TEXAL DEVELOPMENT LTD., 5th Floor, 134 Abbott Street, Vancouver 4.

DESCRIPTION: The property is underlain by Nicola Group volcanic rocks.

WORK DONE: Reconnaissance geochemical soil survey, 250 samples.

REFERENCE: Assessment Report 4059.

MOORE (No. 58, Fig. B)

LOCATION: Lat. 50° 17.5'-18.8' Long. 120° 27.4'-29.8' (92I/8W)
NICOLA M.D. Four miles north of the northeast end of Nicola Lake at 3,500 to 4,500 feet elevation.

CLAIMS: MOORE 1 to 26.

ACCESS: By road from Nicola, 16 miles.

OWNER: CANADIAN JOHNS–MANVILLE COMPANY LIMITED, Box 1500, Asbestos, P.Q.

DESCRIPTION: The claims cover an area of chlorite schist and amphibolites lying between Nicola Group volcanic rocks and the Nicola batholith to the west.

(92I/8W)

WORK DONE: Surface geological mapping, 1 inch equals 500 feet; magnetometer survey, 11 line-miles; electromagnetic survey, 6.98 line-miles; geochemical soil and twig survey, 1,115 samples.
REFERENCES: Assessment Reports 3710, 3744.

TL (No. 260, Fig. B)

LOCATION: Lat. 50° 19.5'-21.5' Long. 120° 24.5'-27' (92I/8W)
NICOLA M.D. On the western side of the southern end of Stump Lake, at 2,400 to 3,500 feet elevation.
CLAIMS: TL 1 to 36, 49 to 54, 57 to 60.
ACCESS: Highway 5 lies a few hundred feet east of the claim group and dirt ranch roads cut through the group.
OPERATOR: CONSOLIDATED COAST SILVER MINES LTD., 1790, 777 Hornby Street, Vancouver 1.
WORK DONE: Geochemical and magnetometer surveys over 35 line-miles of grid.
REFERENCE: Assessment Report 4164.

MARY REYNOLDS (No. 214, Fig. B)

LOCATION: Lat. 50° 19.8' Long. 120° 20.5' (92I/8W)
NICOLA M.D. Two miles south-southeast of the middle of Stump Lake.
CLAIMS: PV 1 to 12, PV Fraction, ARD 1 to 5, ARD 1 to 3 Fractions, ND 1 to 3, IXL 5, Mineral Lease M-19 (ROBERT DUNSMUIR, Lot 673), Mineral Lease M-20 (MARY REYNOLDS, Lot 674 and GOLD CUP, Lot 675).
ACCESS: By Highway 5 from Merritt, 28 miles then 2.5 miles up Peterhope road.
OWNER: PINE VALLEY EXPLORERS LTD., Box 441, Merritt.
METALS: Silver, gold, lead, zinc.
DESCRIPTION: The showings consist of silver and gold-bearing quartz-calcite veins and galena, sphalerite, and pyrite mineralization associated with quartz-carbonate alteration zones in massive to slightly foliated augite andesite of the Nicola Group.
WORK DONE: Line-cutting.
REFERENCE: *Geol. Surv., Canada*, Mem. 249, pp. 57, 58.

SHER (No. 158, Fig. B)

LOCATION: Lat. 50° 20'-21.5' Long. 120° 19.5'-22.5' (92I/8W)
NICOLA M.D. At approximately 2,500 feet elevation on the southeast side of the centre of Stump Lake.
CLAIMS: SHER 17, 19, 21, 23, 25, 27, 29 to 46, 55 to 70, JO 1 to 8, FIR 53, 54, A Fraction, B Fraction, SR 1 and 3.
ACCESS: By gravel road from Highway 5, 2 miles.
OWNER: LONDON PRIDE SILVER MINES LTD., 848 West Hastings Street, Vancouver 1.

METALS: Lead, zinc, silver, copper, gold.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; electromagnetic surveys, 38 line-miles; magnetometer survey, 40 line-miles covering all claims; geochemical survey, approximately 1,000 samples covering all claims.

REFERENCES: The claims appear to cover the DON or SCOTTIE showing described in *Geol. Surv., Canada,* Mem. 249, p. 58 and *B.C. Dept. of Mines,* Bull. 10 (revised), p. 115.

TRUMP (No. 259, Fig. B)

LOCATION: Lat. 50° 22'-24' Long. 120° 17.5'-21' (92I/8W)
KAMLOOPS and NICOLA M.D. On the east side of the northern end of Stump Lake, at 2,400 to 3,200 feet elevation.

CLAIMS: TRUMP 1 to 18, WIND 35 to 38, FIR 17 to 20, 29 to 48, SHER 1 to 6, 8, 10, 12, 14, 16.

ACCESS: By all-weather logging roads, 2 miles from Highway 5.

OPERATOR: ANGLO-WESTERN MINERALS LTD., 848 West Hastings Street, Vancouver 1.

METALS: Copper, silver.

DESCRIPTION: Sulphides are sparsely disseminated in a zone of sheared and altered Nicola volcanic rocks.

WORK DONE: Geological, electromagnetic, magnetic, and geochemical surveys.

REFERENCE: Assessment Report 4165.

PAUL (No. 215, Fig. B)

LOCATION: Lat. 50° 25' Long. 120° 25' (92I/8W)
KAMLOOPS M.D. Hollis Creek at Moore Creek, 4 miles northwest of Stump Lake.

CLAIMS: PAUL 1 to 30.

ACCESS: By gravel road from Highway 5 at Tullee Lake, 6 miles.

OWNER: NEWCONEX CANADIAN EXPLORATION LTD., 808, 525 Seymour Street, Vancouver 2.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; geochemical soil survey, approximately 600 samples.

J (No. 157, Fig. B)

LOCATION: Lat. 50° 28'-31' Long. 120° 24'-27' (92I/8W, 9W)
KAMLOOPS M.D. Between Ross Moore and McConnell Lakes, east and south of Lac Le Jeune.

CLAIMS: J 1 to 156.

ACCESS: By road from the Lac Le Jeune road, 3 miles.

OWNER: LARGO MINES LTD., 1110, 505 Burrard Street, Vancouver 1.

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 400 feet;

magnetometer survey, 60 line-miles; and geochemical soil survey, 3,500 samples covering all claims; road construction, 5 miles (between Lac Le Jeune and Ross Moore Lake).

PINE (No. 18, Fig. B)

LOCATION: Lat. 50° 28.5'-32.8' Long. 120° 26.8'-30.2' (92I/8W, 9W, 10E)
KAMLOOPS M.D. At elevations of 4,200 to 4,800 feet between Lac Le Jeune and McConnell Lake, 15 miles south of Kamloops.

CLAIMS: PINE 1 to 110, FIR 1 to 42, HILL 1 to 7 Fractions.

ACCESS: By road from Kamloops.

OWNER: CANADIAN JOHNS-MANVILLE COMPANY LIMITED, Box 1500, Asbestos, P.Q.

DESCRIPTION: The Nicola batholith intrudes Upper Triassic Nicola Group volcanic rocks. Claims are partly overlain by Miocene Kamloops Group volcanic rocks.

WORK DONE: Induced polarization survey, 36.5 line-miles; electromagnetic survey; geochemical surveys, 1,084 soil and 98 twig samples during 1971.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 323; Assessment Reports 3592, 3891, 3892, 3893.

LEE (No. 213, Fig. B)

LOCATION: Lat. 50° 25' Long. 120° 14' (92I/8E)
KAMLOOPS M.D. Five miles northeast of Stump Lake.

CLAIMS: LEE 1 to 20.

ACCESS: By road from Kamloops, 25 miles.

OWNER: WESTERN STANDARD SILVER MINES LTD., Box 462, Kelowna.

WORK DONE: Reconnaissance geochemical survey.

SUN, MOON (No. 159, Fig. B)

LOCATION: Lat. 50° 32.5'-35' Long. 120° 10'-14.5' (92I/9E)
KAMLOOPS M.D. On Campbell Creek between Walker Lake and Scuitto Creek, 9 miles south-southeast of Kamloops.

CLAIMS: SUN 1 to 20, MOON 1 to 32.

ACCESS: By Highway 5 and gravel road from Kamloops.

OPERATOR: COLUMBIA METALS CORPORATION, LIMITED, 34 Adelaide Street West, Toronto, Ont.

WORK DONE: Line-cutting; geological mapping, 1 inch equals 400 feet; geochemical soil survey, 423 samples.

REFERENCE: Assessment Report 4020.

DIV, AB (No. 160, Fig. B)

LOCATION: Lat. 50° 35.5'-38' Long. 120° 11'-13' (92I/9E)
KAMLOOPS M.D. At approximately 3,000 feet elevation on Campbell Creek and to the northwest, 6 miles southeast of Kamloops.

(92I/9E)

CLAIMS: DIV 1 to 30, AB 1 to 20.

ACCESS: By gravel road from Knutsford, 5 miles.

OPERATORS: FOURBAR MINES LTD. and ADERA MINING LIMITED, c/o 320, 355 Burrard Street, Vancouver 1.

WORK DONE: Surface geological mapping; geochemical soil survey; surface diamond drilling, two holes totalling approximately 250 feet.

MOT (No. 13, Fig. B)

LOCATION: Lat. 50° 37.5' Long. 120° 07.4' (92I/9E)
KAMLOOPS M.D. Near Barnhart Vale, one-half mile east of Campbell Creek, 12 miles southeast of Kamloops.

CLAIMS: MOT 1 to 30.

ACCESS: By road from Kamloops.

OWNER: COPPER RANGE EXPLORATION COMPANY, INC., 1425 Brentwood Street, Lakewood, Colorado.

WORK DONE: Geochemical survey during 1971; induced polarization survey covering Mot 1-4 during 1972.

REFERENCES: Assessment Reports 3616, 4018.

PIPE, OIL (No. 195, Fig. B)

LOCATION: Lat. 50° 36.5'-38' Long. 120° 14.5'-16' (92I/9E, 9W)
KAMLOOPS M.D. The property is centred 4.5 miles southeast of Kamloops.

CLAIMS: PIPE 1 to 20, OIL 1 to 40.

ACCESS: By all-weather gravel road, 3 miles east from Knutsford.

OWNER: EAGLE RIVER MINES LTD., 1, 425 Howe Street, Vancouver 1.

DESCRIPTION: The western portion of the property is underlain by Cache Creek volcanic and sedimentary rocks, while the eastern portion is underlain by granodiorite and quartz diorite of the Wildhorse Mountain batholith.

WORK DONE: Geological survey; geochemical soil survey, 120 samples.

REFERENCE: Assessment Report 4115.

NY (No. 165, Fig. B)

LOCATION: Lat. 50° 32' Long. 120° 19' (92I/9W)
KAMLOOPS M.D. South of McLeod Lake and east of Nichol Lake, 10 miles south of Kamloops.

CLAIMS: NY 1 to 20.

ACCESS: By Highway 5 and secondary road from Kamloops.

OWNER: ESTEY AGENCIES LTD., 17th Floor, 1177 West Hastings Street, Vancouver 1.

WORK DONE: Electromagnetic survey.

REFERENCE: Assessment Report 4024.

RENE (No. 199, Fig. B)

LOCATION: Lat. 50° 32.5'-34' Long. 120° 24.5'-26' (92I/9W)
KAMLOOPS M.D. At approximately 4,000 feet elevation on the Lac Le Jeune road, 8.5 miles south-southwest of Kamloops.
CLAIMS: RENE 1 to 24.
ACCESS: By the Lac Le Jeune road from Kamloops, 10 miles.
OWNER: ISKUT SILVER MINES LTD., 534 Burrard Street, Vancouver 1.
DESCRIPTION: The property is underlain by chlorite-quartz-mica schists of Mesozoic age. A limited capping of Tertiary Kamloops volcanic rocks covers the claims to the northwest and southeast. Rock exposures are limited. Glacial till and eskers are widespread.
WORK DONE: Surface geological mapping, 1 inch equals 400 feet; magnetometer survey, 30 line-miles; and geochemical soil survey, 460 samples covering all claims.

ADD, TIN (No. 166, Fig. B)

LOCATION: Lat. 50° 32'-34.5' Long. 120° 26'-28.5' (92I/9W)
KAMLOOPS M.D. Four miles south-southwest of Jacko Lake, 9 miles southwest of Kamloops.
CLAIMS: ADD 5 to 36, TIN 1 to 34.
ACCESS: By road from Kamloops, 9 miles.
OWNER: RIVIERA INDUSTRIES & RESOURCES LTD., 200, 505 Burrard Street, Vancouver 1.
WORK DONE: Surface geological mapping covering Tin 1-12 and Add 5-36; induced polarization survey, 4 line-miles covering Add 23-26; line-cutting, 20 line-miles covering Add 5-16 and 23-28; geochemical survey, 126 samples covering Tim 1-12 and Add 5-36; percussion drilling, six holes totalling 2,100 feet on Add 25 and 26.

ROSE (No. 17, Fig. B)

LOCATION: Lat. 50° 33.2' Long. 120° 23' (92I/9W)
KAMLOOPS M.D. At 3,000 to 3,700 feet elevation 2.5 miles west of McLeod Lake, 9 miles south of Kamloops.
CLAIMS: ROSE 12 to 35.
ACCESS: By gravel road from Kamloops.
OWNER: PRINCESS VENTURES LTD., 534, 789 West Pender Street, Vancouver 1.
WORK DONE: Magnetometer survey; geochemical soil survey, 773 samples.
REFERENCE: Assessment Report 3887.

S (No. 201, Fig. B)

LOCATION: Lat. 50° 34.2' Long. 120° 25' (92I/9W)
KAMLOOPS M.D. Between 3,300 and 3,700 feet elevation on the east side of Lac Le Jeune road, 8 miles south-southwest of Kamloops.

CLAIMS: S 5 to 14.

ACCESS: By the Trans-Canada Highway to Lac Le Jeune turnoff then south 7 miles.

OWNER: BELCARRA EXPLORATIONS LTD., 420, 475 Howe Street, Vancouver 1.

DESCRIPTION: The Nicola Group volcanic rocks have been altered and sheared. A small outcrop of microdiorite possibly related to the Iron Mask batholith occurs on the east end of the claim group.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet and ground magnetometer survey, 7.3 line-miles covering all claims; percussion drilling, two holes totalling 330 feet on S 7 and 8.

REFERENCE: Assessment Report 4117.

ARLENE (No. 200, Fig. B)

LOCATION: Lat. 50° 34'-35' Long. 120° 21.5'-26.5' (92I/9W)
KAMLOOPS M.D. Seven miles south-southwest of Kamloops, from Edith Lake to the Lac Le Jeune road.

CLAIMS: ARLENE 1 to 23, 25 to 30, 32, 34, 36 to 40, 42 to 46, 47 Fraction.

ACCESS: Lac Le Jeune road passes through the property.

OWNER: Colt Resources Ltd.

OPERATOR: ORO MINES LTD., 707, 475 Howe Street, Vancouver 1.

WORK DONE: Airborne magnetometer survey, 52 line-miles covering all claims; percussion drilling, four holes totalling 1,080 feet on Arlene 28.

JOKER (No. 164, Fig. B)

LOCATION: Lat. 50° 34.5' Long. 120° 18.0' (92I/9W)
KAMLOOPS M.D. At approximately 2,500 feet elevation south and southwest of Separation Lake, 7 miles south of Kamloops.

CLAIMS: JD 12, 21 to 90, 103 to 108, PIN 1 to 7 Fractions.

ACCESS: By road from Highway 5, one-quarter mile.

OWNER: FLAGSTONE MINES LTD., 1110, 505 Burrard Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The property covers microdiorite and picrite basalt covered in part by Tertiary lavas. Copper mineralization is widespread.

WORK DONE: Claims and surface workings mapped; surface geological mapping; magnetometer survey, 40 line-miles; geochemical soil survey, 2,000 samples.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1967, p. 141 (A, C, Cle); Assessment Reports 772, 965, 1746, 4160.

TIA, HOPE (No. 16, Fig. B)

LOCATION: Lat. 50° 35' Long. 120° 22.4' (92I/9W)
KAMLOOPS M.D. One mile northwest of Edith Lake, 10 miles south of Kamloops.

CLAIMS: TIA 1 to 14, HOPE 2 and 3.
ACCESS: By Highway 5 and gravel road from Kamloops.
OWNER: LORI EXPLORATIONS LTD., 617, 837 West Hastings Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Mineralization occurs in shears and as disseminations in microdiorite.
WORK DONE: Magnetometer survey; geochemical survey, 660 samples.
REFERENCES: Assessment Reports 3714, 3762.

MIX (No. 197, Fig. B)

LOCATION: Lat. 50° 35' Long. 120° 24' (92I/9W)
KAMLOOPS M.D. Seven miles south-southwest of Kamloops and 2 miles south of Jacko Lake.
CLAIMS: MIX 1 to 9, 37 and 38.
ACCESS: By road from Kamloops, approximately 12 miles.
OWNER: Continental Potash Corporation Limited.
OPERATOR: MOLYMINE EXPLORATIONS LTD., 2060, 505 Burrard Street, Vancouver 1.
DESCRIPTION: The area of the Mix claims is underlain mainly by volcanic rocks of the Triassic Nicola Group which may be cut by minor offshoots of the Iron Mask batholith.
WORK DONE: Surface diamond drilling, two holes totalling 1,064 feet on Mix 1.
REFERENCES: Assessment Reports 722, 723, 724.

RITE (No. 19, Fig. B)

LOCATION: Lat. 50° 35' Long. 120° 27.3' (92I/9W)
KAMLOOPS M.D. Near Timber Lake, 8 miles southwest of Kamloops.
CLAIMS: RITE 15 to 28, 33 to 36.
ACCESS: By the Lac Le Jeune road from Kamloops.
OWNER: DEMSEY MINES LTD., 230, 890 West Pender Street, Vancouver 1.
WORK DONE: Geological, magnetometer, and geochemical surveys.
REFERENCE: Assessment Report 3608.

TAR, JL (No. 198, Fig. B)

LOCATION: Lat. 50° 35'-36' Long. 120° 23'-29' (92I/9W)
KAMLOOPS M.D. The property is centred 1 mile south of Jacko Lake and 7 miles southwest of Kamloops.
CLAIMS: TAR 1 to 32, JL 1 to 16, 18, 20 to 36, MEL 1 to 32, DIVIDE Fraction.
ACCESS: By the Lac Le Jeune road from the Trans-Canada Highway, 3 miles.
OWNER: Calico Silver Mines Ltd.
OPERATORS: CALICO SILVER MINES LTD. and GIBBEX MINES LTD., 420, 475 Howe Street, Vancouver 1.
METAL: Copper.

WORK DONE: Claims mapped; preliminary surface geological mapping; trenching, 600 feet on JL 31, 33, and Divide Fraction; surface diamond drilling, seven holes totalling 1,416 feet on Tar 5, 10, 11, 21, 26, JL 31, 33, and Divide Fraction; percussion drilling, 14 holes totalling 3,204 feet on JL 3, 5, and 7 and 3 holes totalling 850 feet on Tar 20.

REFERENCES: Assessment Reports 722, 723, 724.

FARGO (No. 203, Fig. B)

LOCATION: Lat. 50° 35.1′ Long. 120° 21.0′ (92I/9W)
KAMLOOPS M.D. On the north and west sides of Edith Lake, 6 to 8 miles south-southwest of Kamloops.

CLAIMS: ROSE 1 to 44 (in part former MR claims).

ACCESS: By paved road from Kamloops to Knutsford, thence by gravel road, 3 miles southwest to the property.

OWNER: PLAZA RESOURCES LTD., 534, 789 West Pender Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Minor magnetite, pyrite, chalcopyrite, azurite, and malachite occur in a shear zone at the contact between Nicola Group volcanic rocks and Iron Mask diorite. The showings are located on ROSE 39 and 41 claims and have been previously described as the FARGO group (*Geol. Surv., Canada,* Mem. 249, pp. 114, 115).

WORK DONE: Geochemical and magnetometer surveys covering Rose 1-11 and 36-44; percussion drilling, five holes totalling 605 feet on Rose 39.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 321 (MR); *Geol. Surv., Canada,* Mem. 249, pp. 114, 115; Assessment Reports 2821 (MR), 4111.

PAM (No. 161, Fig. B)

LOCATION: Lat. 50° 35.5′-37′ Long. 120° 21′-26′ (92I/9W)
KAMLOOPS M.D. In the vicinity of Jacko Lake and Peterson Creek, approximately 5 miles southwest of Kamloops.

CLAIMS: PAM, MAP, DAVE, DON, FOX, X, B, WADE, totalling 86.

ACCESS: By road from Knutsford, 4 miles.

OWNERS: Rolling Hills Copper Mines Limited and Minex Development Ltd.

OPERATOR: MINEX DEVELOPMENT LTD., 210, 470 Granville Street, Vancouver 2.

METAL: Copper.

DESCRIPTION: Copper mineralization occurs in dioritic rocks of the Iron Mask batholith.

WORK DONE: Geological mapping, 1 inch equals 500 feet; induced polarization and magnetometer surveys; percussion drilling, 10 holes totalling 3,000 feet.

REFERENCES: Assessment Reports 3630, 4009, 4014, 4015, 4036.

IRONMASK, BATH (No. 202, Fig. B)

LOCATION: Lat. 50° 36′ Long. 120° 22′ (92I/9W)
KAMLOOPS M.D. Southwest of the junction of Humphrey and Peterson Creeks, 5 miles south-southwest of Kamloops.
CLAIMS: IRONMASK 1 to 12, BATH 1 to 18.
ACCESS: By paved then gravel road from Kamloops, approximately 7 miles.
OWNER: PRISM RESOURCES LIMITED, 805, 850 West Hastings Street, Vancouver 1.
DESCRIPTION: The claims straddle the southwestern contact of the Iron Mask batholith and Nicola Group volcanic rocks.
WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 1,000 feet; induced polarization survey, 12.9 line-miles; magnetometer survey, approximately 6 line-miles; geochemical soil survey, 273 samples; percussion drilling, eight holes totalling 1,500 feet.

IM (No. 163, Fig. B)

LOCATION: Lat. 50° 36.5′ Long. 120° 20.5′ (92I/9W)
KAMLOOPS M.D. At approximately 3,000 feet elevation from Knutsford southward to Edith Lake, or from 3 to 6 miles south of Kamloops.
CLAIMS: IM, MR, EL, DISPATCHER (Lot 1748), HAWTHORNE (Lot 834), totalling 114.
ACCESS: By road from Kamloops, 5 miles.
OWNER: Pan Ocean Oil Ltd.
OPERATOR: CRAIGMONT MINES LIMITED, 270, 180 Seymour Street, Kamloops.
METAL: Copper.
WORK DONE: Surface diamond drilling, 16 holes totalling 3,024 feet on IM 28, 30, 35-38; rotary drilling, three holes totalling 298 feet on IM 30, 68; percussion drilling, 15 holes totalling 3,190 feet on IM 22, 28, 30, 60.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 295.

A (No. 204, Fig. B)

LOCATION: Lat. 50° 36.5′-39.5′ Long. 120° 16.5′ (92I/9W)
KAMLOOPS M.D. The property comprises a strip of land 2.5 miles long and one-half mile wide lying on the north and west slopes of Rose Hill and centred 3 miles southeast of Kamloops.
CLAIMS: A 9 to 28.
ACCESS: By secondary roads from Kamloops and Knutsford.
OWNER: Q.C. EXPLORATIONS LTD., 408, 470 Granville Street, Vancouver 2.
DESCRIPTION: The claims are underlain by Cache Creek sedimentary and volcanic rocks.
WORK DONE: Line-cutting; geochemical survey.
REFERENCE: Assessment Report 4109.

KN (No. 14, Fig. B)

LOCATION: Lat. 50° 37.2′ Long. 120° 20.6′ (92I/9W)
KAMLOOPS M.D. At elevations of 2,500 to 3,200 feet immediately west of Knutsford, 3 miles south-southwest of Kamloops.
CLAIMS: KN 1, KN 2 and 3 Fractions.
ACCESS: By Highway 5 from Kamloops.
OWNER: ROYAL CANADIAN VENTURES LTD., 270, 180 Seymour Street, Kamloops.
METAL: Copper.
WORK DONE: Geochemical survey during 1971.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 296; Assessment Report 3524.

DM, LORNA, RO (No. 21, Fig. B)

LOCATION: Lat. 50° 37.5′-41′ Long. 120° 27′-29.5′ (92I/9W)
KAMLOOPS M.D. At approximately 2,200 feet elevation 6 miles west of Kamloops, north and south of the Trans-Canada Highway.
CLAIMS: DM, LORNA, RO, MONZO, AUDRA, ID, POT, totalling approximately 65 plus CON VERDANT (Lot 1341), MAY Fraction (Lot 1311), SODIUM Fraction (Lot 4666), WINTY (Lot 4667) and Mineral Lease M-21 (IRON CAP, Lot 875).
ACCESS: By highway from Kamloops, 6 miles.
OWNER: Comet Industries Ltd.
OPERATOR: INITIAL DEVELOPERS CORPORATION LIMITED, 2502, 1177 West Hastings Street, Vancouver 1.
METALS: Copper, gold, silver.
DESCRIPTION: Mineralization occurs both as fracture fillings and disseminations of pyrite, magnetite, chalcopyrite, bornite, and native copper within fractured intrusive rocks of the Iron Mask batholith.
WORK DONE: Claims, topography, and surface workings mapped; surface geological mapping, 1 inch equals 200 feet covering all claims and 1 inch equals 400 feet covering north-central claims; magnetometer, electromagnetic, and induced polarization surveys, 30 line-miles covering essentially all claims; geochemical survey; surface diamond drilling, 25 holes totalling 7,500 feet; percussion drilling, 22 holes totalling 6,600 feet.
REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1962, p. 60; 1967, pp. 144-147; Assessment Reports 655, 727, 3554.

X, PAM (No. 15, Fig. B)

LOCATION: Lat. 50° 38′ Long. 120° 26.5′ (92I/9W)
KAMLOOPS M.D. Between Jacko and Wallender Lakes, approximately 6 miles southwest of Kamloops.
CLAIMS: X 2 to 5, 7, 9, 10, 12, 16, 18, 20, 22, 24, 28, 30, 32, PAM 1 to 4, 6, 7, PAM 1 to 3 and 5 Fractions, CADDIE 1, 2, 5, 6, CADDIE 1 and 2 Fractions, KEN 5, TERRY, MARIANNA.

ACCESS: From the Trans-Canada Highway by the Lac Le Jeune Highway, 3 miles.

OWNER: Rolling Hills Copper Mines Limited.

OPERATOR: HIGHLAND MERCURY MINES LIMITED, 700, 1177 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The property is underlain by microdiorite and hornblende diorite of the Iron Mask batholith and basic volcanic rocks of the Nicola Group intruded by some hornblende porphyry dykes. Several easterly trending steep faults transect the property. Pyrite and chalcopyrite and magnetite occur in surface exposures.

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 400 feet; magnetometer survey, 23.5 line-miles; electromagnetic survey, 12.7 line-miles; induced polarization survey, 12.5 line-miles; geochemical survey, 975 samples; surface diamond drilling, three holes totalling 1,652 feet on X 2 and 3; percussion drilling totalling 2,650 feet on Pam 1, 2, 3, 3 Fraction, and 6.

REFERENCE: Assessment Report 4013.

A, ROCK (No. 167, Fig. B)

LOCATION: Lat. 50° 38.5' Long. 120° 29.5' (92I/9W)
KAMLOOPS M.D. Between 2,500 and 2,700 feet elevation on Sugarloaf Hill, 8 miles west-southwest of Kamloops.

CLAIMS: A 1 to 16, A 1 to 6 Fractions, ROCK 11 to 17, ROCK 20 Fraction, AA 1 to 4.

ACCESS: Six miles by the Trans-Canada Highway west from Kamloops thence 4 miles south by gravel road.

OWNER: ROCKET MINES LTD., 420, 475 Howe Street, Vancouver 1.

DESCRIPTION: The property is underlain by volcanic rocks of the Nicola Group which are overlain by volcanic rocks of the Kamloops Group and glacial till. The contact with the Iron Mask batholith occurs at the eastern perimeter of the claims.

WORK DONE: Claims mapped; preliminary geological mapping; ground magnetometer survey, 7.75 line-miles covering Rock 20 Fraction, A 1-4, 6-8, AA 1-2, and Rock 11-13; percussion drilling, four holes totalling 1,000 feet on A 2, 4, 8 and Rock 11.

REFERENCE: Assessment Report 4019.

MAKAOO (No. 162, Fig. B)

LOCATION: Lat. 50° 38.7' Long. 120° 23.7' (92I/9W)
KAMLOOPS M.D. The property is centred 4 miles west-southwest of Kamloops.

CLAIMS: LOST CHORD, PYTHON NO. 2, NOONDAY, COPPERHEAD, and PYTHON (Lots 2561 to 2565) and 66 located claims including PYTHON, PYE, CUB, JET, TOP, COLT, LINE, STATIC, etc.

(92I/9W)

ACCESS: By road from Kamloops, 8 miles.

OWNER: Makaoo Development Company Limited.

OPERATORS: ISO MINES LTD. and TECK CORPORATION LTD., 700, 1177 West Hastings Street, Vancouver 1.

METALS: Copper, silver, gold.

DESCRIPTION: Chalcopyrite and bornite occur as disseminations and fracture fillings in shear zones near the contact between diorite of the Iron Mask batholith and intrusive picrite.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 400 feet covering all claims; induced polarization survey, 3.5 line-miles covering Python and Noonday Crown grants and Python 8 Fraction; geochemical survey, 560 samples covering Top 2 Fraction, Cub 4, 6, 9, 10, Line 2, Colt 1, 2, Python 3, and Copperhead Crown grant; surface diamond drilling, seven holes totalling 3,197 feet on Noonday Crown grant; percussion drilling, 41 holes totalling 12,550 feet on Cub 5, Pye 3, Jet 7 Fraction, Jet 8, 10, 14, 15, 17, and Static Fraction.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1956, pp. 54-57; 1967, pp. 137-141; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 321.

IRON MASK (No. 194, Fig. B)

LOCATION: Lat. 50° 39.5′ Long. 120° 26′ (92I/9W)
KAMLOOPS M.D. At approximately 2,750 feet elevation 5 miles west of Kamloops at the junction of the Lac Le Jeune and Trans-Canada Highways.

CLAIMS: Twelve Crown-granted claims including IRON MASK (Lot 878), COPPER QUEEN (Lot 880), ERIN (Lot 1066), NORMA (Lot 1302), VICTOR (Lot 1340), and MINT Fraction (Lot 1342) and six mineral leases.

ACCESS: By the Trans-Canada Highway west from Kamloops, 5 miles.

OWNER: Davenport Oil & Mining Ltd.

OPERATORS: INITIAL DEVELOPERS CORPORATION LIMITED and COMET INDUSTRIES LTD., 2502, 1177 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Within the Iron Mask batholith, copper mineralization occurs in veins, breccia structures, and disseminated bodies in serpentinized picrite basalt and Cherry Creek and Sugarloaf porphyries.

WORK DONE: Claims, topography, and surface workings mapped; surface geological mapping, 1 inch equals 200 feet covering all claims; electromagnetic, magnetometer, and induced polarization surveys, approximately 10 line-miles covering all claims; geochemical survey, approximately 30 samples covering Iron Mask, Erin, Norma, Copper Queen, Mint Fraction, and Victor; surface diamond drilling, 13 holes totalling approximately 6,500 feet on Mint Fraction, Norma, and Victor; rotary drilling, two holes totalling 1,200 feet on Mint Fraction; percussion drilling, 12 holes totalling 4,200 feet on Mint Fraction, Norma, and Victor.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1956, pp. 47-69; 1962, p. 60; 1967, pp. 137-141; Assessment Report 655.

KENCO (No. 196, Fig. B)

LOCATION: Lat. 50° 40.5' Long. 120° 24' (92I/9W)
KAMLOOPS M.D. Between the Thompson River and the Trans-Canada Highway, 3 miles west of Kamloops.
CLAIMS: KENCO 1 to 22.
ACCESS: By several dirt roads from the Trans-Canada Highway.
OWNER: North Bay Mines & Oils Ltd.
OPERATOR: GEO-STAR RESOURCES LTD., 514, 355 Burrard Street, Vancouver 1.
WORK DONE: Magnetometer survey; geochemical soil survey, 221 samples.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 296; Assessment Report 4116.

EB (No. 193, Fig. B)

LOCATION: Lat. 50° 41' Long. 120° 27' (92I/9W)
KAMLOOPS M.D. At approximately 2,400 feet elevation 5 miles west of Kamloops and 1 mile north of the Trans-Canada Highway.
CLAIMS: EB 1 to 19, RO 47 to 52, ID 1 to 7, 14 to 16 Fractions.
ACCESS: By the Trans-Canada Highway west from Kamloops, 5 miles.
OWNER: INITIAL DEVELOPERS CORPORATION LIMITED, 2502, 1177 West Hastings Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: The property covers the north ridge of the Iron Mask batholith where it is in contact with the Nicola Group. Rocks are extensively sheared and mineralized with pyrite and minor copper. Volcanic rocks of the Kamloops Group cover part of the claim group.
WORK DONE: Claims and topography mapped; surface geological mapping, 1 inch equals 400 feet covering all claims; magnetometer, electromagnetic, and induced polarization surveys, 10 line-miles covering essentially all claims.

ZZ (No. 168, Fig. B)

LOCATION: Lat. 50° 41' Long. 120° 30' (92I/9W, 10E)
KAMLOOPS M.D. At approximately 2,000 feet elevation on the north side of Highway 1, 8 miles due west of Kamloops.
CLAIMS: ZZ 9, 11, 21 to 24, 33 to 36, 45 to 48, LAST 1 to 10, AMEX 2, 3, 9, and 10 Fractions.
ACCESS: By road from Kamloops, 10 miles.
OPERATOR: RAYORE ENTERPRISES LTD., 420 Howe Street, Vancouver 1.
METAL: Copper.

(92I/9W, 10E)

DESCRIPTION: The property covers the northern contact of the Iron Mask batholith with Nicola Group rocks. Both are overlain in part by sedimentary and volcanic rocks of the Kamloops Group. Minor copper mineralization is found in the batholith and some sedimentary rocks.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; geochemical soil survey, 48 samples on ZZ 23; surface diamond drilling, two holes totalling 1,064 feet on ZZ 23; percussion drilling, four holes totalling 1,200 feet on ZZ 21, 22, and 24.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, pp. 296, 297; Assessment Report 4158.

REN (No. 20, Fig. B)

LOCATION: Lat. 50° 36.5′-37.5′ Long. 120° 29.3′-31′ (92I/9W, 10E) KAMLOOPS M.D. Immediately north of Dam Lake, 3 miles south of Highway 1 and 9 miles southwest of Kamloops.

CLAIMS: REN 1 to 30.

ACCESS: By Highway 1 and secondary road from Kamloops.

OWNER: EAGLE BAY MINES LTD., 570, 885 Dunsmuir Street, Vancouver 1.

WORK DONE: Line-cutting; geochemical, magnetometer, and induced polarization surveys.

REFERENCE: Assessment Report 3825.

TOP (No. 256, Fig. B)

LOCATION: Lat. 50° 32.5′-34.5′ Long. 120° 30′-31.5′ (92I/10E) KAMLOOPS M.D. At 5,000 feet elevation north of Eureka Lake and 10 miles southwest of Kamloops.

CLAIMS: TOP 1 to 31.

ACCESS: Fifteen miles south from Highway 1 by the Lac Le Jeune Highway, thence 5 miles by bush road.

OWNER: JOY MINING LIMITED, 390 West Hastings Street, Vancouver 3.

DESCRIPTION: A few outcrops of dark grey to greenish grey, Nicola Group (?) andesite were seen on the property.

WORK DONE: Magnetometer survey.

REFERENCE: Assessment Report 4118.

ELLA (No. 174, Fig. B)

LOCATION: Lat. 50° 34′-36′ Long. 120° 34.5′-37.5′ (92I/10E) KAMLOOPS M.D. At approximately 4,500 feet elevation at the head of Cherry Creek, 3 miles east of Dominic Lake and 14 miles west-southwest of Kamloops.

CLAIMS: ELLA 1 to 59.

ACCESS: By road from Cherry Creek, 10 miles.

OWNERS: GREAT NORTHERN PETROLEUMS & MINES LTD. and FLAGSTONE MINES LIMITED, 1110, 505 Burrard Street, Vancouver 1.

(92I/10E)

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 400 feet covering a major part of the claim group; ground magnetometer survey, 20 line-miles covering a few claims; geochemical soil survey, 5,000 samples covering all claims.

REFERENCE: Assessment Report 4023 (line-cutting).

TC, SPUR, OP (No. 173, Fig. B)

LOCATION: Lat. 50° 35.0' Long. 120° 39.5' (92I/10E)
KAMLOOPS M.D. At approximately 5,000 feet elevation in the vicinity of Dominic, Roper, and Andrew Lakes, 16 miles west-southwest of Kamloops.

CLAIMS: TC 7 to 16, 25 to 36, SPUR 1 to 10, 12, OP 1 to 46, 55 to 70, LA 1 to 4, JC 1 to 8, BRUCE 59 to 66, BRUCE 67 to 70 Fractions, E, F, G, H, I, L, O, P, Q Fractions.

ACCESS: By gravel road from Cherry Creek, 16 miles.

OWNER: DOMINIC LAKE MINING COMPANY LTD., 848 West Hastings Street, Vancouver 1.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; magnetometer survey, 44 line-miles; and geochemical soil survey, 877 samples covering OP 15-46 and 55-70.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 297; Assessment Report 4110.

RAG (No. 32, Fig. B)

LOCATION: Lat. 50° 36.5' Long. 120° 40.4' (92I/10E)
KAMLOOPS M.D. Between Durand, Kwilalkwila, and Dominic Lakes, 8 miles south of Cherry Creek, at 5,000 to 5,400 feet elevation.

CLAIMS: RAG 1 to 44, 46 to 52, 57 to 65, 71 to 78, 81, 83, 85 to 89, 95, 96, RAG B, C, E, F Fractions.

ACCESS: By Dominic Lake road from the Trans-Canada Highway at Cherry Creek, 18 miles.

OWNER: Cominco Ltd.

OPERATOR: MID-NORTH EXPLORATIONS LTD., 130, 1030 West Georgia Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: Low-grade disseminated chalcopyrite and bornite mineralization is associated with weak chlorite and epidote alteration in a monzonite core of a Jurassic stock intrusive into Upper Triassic Nicola Group lavas. Some pyrite and copper sulphides occur in the contact zone.

WORK DONE: Line-cutting; induced polarization survey over most of the Rag claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 323; Assessment Reports 3713, 4008.

SHELLY (COAST INTERIOR) (No. 171, Fig. B)

LOCATION: Lat. 50° 36.5′ Long. 120° 33.5′ (92I/10E)
KAMLOOPS M.D. On Cherry Creek, 11.5 miles west-southwest of Kamloops.
CLAIMS: SHELLY 11 to 25.
ACCESS: From Kamloops by the Trans-Canada Highway, 9.5 miles west to the Cherry Creek turnoff, thence 4 miles southeast to the property.
OWNER: COAST INTERIOR VENTURES LTD., 626 West Pender Street, Vancouver 2.
DESCRIPTION: Andesitic rocks of the Nicola Group are intruded by granodiorite.
WORK DONE: Magnetometer survey, 22.16 line miles and geochemical survey covering all claims.
REFERENCE: Assessment Report 4055.

SHELLY (MILESTONE – MONTEREY) (No. 170, Fig. B)

LOCATION: Lat. 50° 36.5′ Long. 120° 32′ (92I/10E)
KAMLOOPS M.D. At approximately 2,900 feet elevation on Cherry Creek, 11 miles west-southwest of Kamloops.
CLAIMS: SHELLY 1 to 10, 26 to 45.
ACCESS: From Kamloops by the Trans-Canada Highway, 9.5 miles west to the Cherry Creek turnoff, thence 4 miles southeast to the property.
OWNERS: Milestone Mines Limited and Monterey Petroleum Corporation (1971) Ltd.
OPERATOR: MILESTONE MINES LIMITED, 574, One Calgary Place, Calgary, Alta.
DESCRIPTION: The property is underlain by fine-grained to coarsely porphyritic Nicola Group andesite lavas, breccias, and tuffs.
WORK DONE: Geochemical soil survey, 540 samples covering Shelly 1-10 and 26-45.
REFERENCE: Assessment Report 4017.

AT, EX (No. 209, Fig. B)

LOCATION: Lat. 50° 37′ Long. 120° 35′ (92I/10E)
KAMLOOPS M.D. At approximately 4,000 feet elevation on the east side of Greenstone Mountain, 12 miles west-southwest of Kamloops.
CLAIMS: AT 1 to 30, EX 9, 11, 19 to 26.
ACCESS: By the Cherry Creek road from the Trans-Canada Highway, 3.5 miles.
OPERATOR: DELTA INTERNATIONAL MINERALS LTD., 420, 475 Howe Street, Vancouver 1.
DESCRIPTION: Nicola Group volcanic rocks occur east of a small intrusive plug.
WORK DONE: Claims mapped; photogeological survey, 1 inch equals 500 feet and helicopter-borne magnetometer survey covering all claims.
REFERENCES: Assessment Reports 4156, 4157.

LED, EX (No. 208, Fig. B)

LOCATION: Lat. 50° 36.5'-39.5' Long. 120° 35'-39' (92I/10E)
KAMLOOPS M.D. On the north side of Greenstone Mountain, 13 miles west-southwest of Kamloops.

CLAIMS: LED 1 to 98, 109 to 134, 139 to 142, EX 1 to 8, 10, 12 to 18, GG 1 to 11, MB 1 to 4.

ACCESS: By the Cherry Creek road from the Trans-Canada Highway, 12 miles.

OWNER: Moneta Porcupine Mines Limited.

OPERATORS: AVINO MINES AND RESOURCES LIMITED and MONETA PORCUPINE MINES LIMITED, 410, 475 Howe Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: The property is underlain by Nicola Group volcanic rocks intruded by a small quartz monzonite pluton. Three showings are known: Led 74 shaft with a quartz calcite vein containing chalcopyrite and bornite; Gilbert Lake area with finely disseminated molybdenite, chalcopyrite, and pyrite in altered plutonic rocks; Greenstone Mountain peak with disseminated pyrite and minor chalcopyrite in altered and brecciated Nicola Group volcanic rocks.

WORK DONE: Surface workings mapped; preliminary surface geological mapping, 1 inch equals 400 feet and geochemical soil survey, approximately 650 samples covering all claims; road construction, 1,000 feet on Led 73 and 74; trenching, 300 feet on Led 74.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 238 (Ned); Assessment Reports 2147, 4155, 4156, 4157.

QQ (No. 179, Fig. B)

LOCATION: Lat. 50° 37' Long. 120° 36.5' (92I/10E)
KAMLOOPS M.D. Between 4,200 and 5,800 feet elevation on the northeast slope of Greenstone Mountain, 13 miles west-southwest of Kamloops.

CLAIMS: QQ 1 to 20, QQ 21 Fraction.

ACCESS: By road from Kamloops.

OWNER: TANZILLA EXPLORATIONS LTD., 4, 558 Howe Street, Vancouver 1.

WORK DONE: Line-cutting; surface geological mapping, 1 inch equals 400 feet covering QQ 1-20; magnetometer survey, 25 line-miles; induced polarization survey, 6 line-miles covering QQ 3-6 and 9-12; geochemical soil survey, 992 samples covering QQ 1-20; surface diamond drilling, two holes totalling 1,092 feet.

REFERENCE: Assessment Report 4010.

BILL, GAL (No. 26, Fig. B)

LOCATION: Lat. 50° 37.2-38.2' Long. 120° 31.4'-34.5' (92I/10E)
KAMLOOPS M.D. Two miles west of Kamloops and 3 miles south of Cherry Creek on the Trans-Canada Highway.

(92I/10E)

CLAIMS: BILL 1 to 40, GAL 1 to 10, CROW 1 and 2, CROW 3 and 4 Fractions.

ACCESS: By Highway 1 from Kamloops.

OWNER: Granite Mountain Mines Ltd.

OPERATORS: EXETER MINES LIMITED, 211, 850 West Hastings Street, Vancouver 1 and GRANITE MOUNTAIN MINES LTD., 330, 470 Granville Street, Vancouver 2.

DESCRIPTION: The claims are underlain by volcanic rocks of the Nicola Group.

WORK DONE: Induced polarization and resistivity survey; magnetometer survey.

REFERENCES: Assessment Reports 3658, 3639.

LANN (No. 27, Fig. B)

LOCATION: Lat. 50° 38' Long. 120° 37' (92I/10E)
KAMLOOPS M.D. On Pendleton Creek, 3 miles east-northeast of Dairy Lakes, approximately 12 miles southwest of Kamloops.

CLAIMS: LANN 1 to 21.

ACCESS: By road from Kamloops, 12 miles.

OWNER: A. L. MARLOW, Box 894, Kamloops.

WORK DONE: Line-cutting.

REFERENCE: Assessment Report 3888.

KON, WIN (No. 25, Fig. B)

LOCATION: Lat. 50° 39' Long. 120° 33.5' (92I/10E)
KAMLOOPS M.D. Centred on Ned Roberts Lake, 1.5 miles south of Highway 1 and 10 miles west of Kamloops.

CLAIMS: KON 1 to 10, WIN 1 to 22, ZIP 1 and 2, KEN 1 to 6.

ACCESS: By Highway 1 from Kamloops.

OWNER: CONCORDE EXPLORATIONS LTD., 101, 535 Thurlow Street, Vancouver 5.

WORK DONE: An induced polarization survey covering 9.6 line-miles was done in 1971.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 322; Assessment Report 3593.

BOW (No. 178, Fig. B)

LOCATION: Lat. 50° 39' Long. 120° 34' (92I/10E)
KAMLOOPS M.D. Between Pendleton and Cherry Creeks, 11 miles west of Kamloops.

CLAIMS: BOW 1 to 4 Fractions, 7 and 8 Fractions.

ACCESS: By Highway 1 and secondary road from Kamloops.

OWNER: BOW RIVER RESOURCES LTD., 333, 885 Dunsmuir Street, Vancouver 1.

DESCRIPTION: The claims are underlain by Nicola Group volcanic and sedimentary rocks.

WORK DONE: Geochemical survey.

REFERENCE: Assessment Report 4007.

B (No. 24, Fig. B)

LOCATION: Lat. 50° 39.5′ Long. 120° 32.7′ (92I/10E)
KAMLOOPS M.D. Between 2,000 and 2,300 feet elevation on the Trans-Canada Highway west of Hughes Lake, 9 miles west of Kamloops.
CLAIMS: B 1 to 9, B 1 to 5 Fractions.
ACCESS: By Highway 1 from Kamloops.
OPERATOR: EQUATORIAL RESOURCES LTD., 1019, 409 Granville Street, Vancouver 2.
WORK DONE: Surface geological mapping, 1 inch equals 400 feet; induced polarization survey, 7.8 line-miles; magnetometer survey, 7.8 line-miles; and geochemical soil surveys, 600 samples covering all claims.
REFERENCE: Assessment Report 3626.

BW, KM (No. 176, Fig. B)

LOCATION: Lat. 50° 39.5′-41′ Long. 120° 37′-42′ (92I/10E)
KAMLOOPS M.D. Along Beaton Creek and northwestward to Duffy Creek, from 12.5 to 16 miles west of Kamloops.
CLAIMS: BW 1 to 20, KM 1 to 36, ROCK 1 to 3, 5 to 8, ROCK 9 Fraction.
ACCESS: By Highway 1 and the Cherry Creek-Dominic Lake road.
OPERATOR: ROCKET MINES LTD., 789 West Pender Street, Vancouver 1.
DESCRIPTION: The property is underlain by Tertiary (?) volcanic rocks and Nicola Group hornblende biotite schists.
WORK DONE: Claims mapped; magnetometer survey, 10 line-miles; surface geological mapping, 1 inch equals 1,000 feet.
REFERENCE: Assessment Report 4016.

BEE (No. 22, Fig. B)

LOCATION: Lat. 50° 39.8′ Long. 120° 31′ (92I/10E)
KAMLOOPS M.D. On the Trans-Canada Highway, 8 miles west of Kamloops.
CLAIMS: BEE 1 and 2.
ACCESS: By Highway 1 from Kamloops.
OWNER: EQUATORIAL RESOURCES LTD., 1019, 409 Granville Street, Vancouver 2.
DESCRIPTION: The area is underlain by the Iron Mask batholith and volcanic rocks of the Nicola and Kamloops Groups.
WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 100 feet; induced polarization survey, 0.9 line-mile; magnetometer survey, 2.4 line-miles; self-potential survey, 0.8 line-mile; surface diamond drilling, five holes totalling 4,908 feet; percussion drilling, five holes totalling 1,520 feet.
REFERENCE: Assessment Report 3624.

JAM, GOLDEN (No 23, Fig. B)

LOCATION: Lat. 50° 40′ Long. 120° 31.5′ (92I/10E)
KAMLOOPS M.D. Immediately north of Highway 1, 9 miles west of Kamloops.

CLAIMS: JAM 1 to 10, 15 to 20, GOLDEN 1 to 6 Fractions, 7 to 14.

ACCESS: By Highway 1 from Kamloops, 10 miles.

OWNERS: Golden Gate Explorations Ltd. and Alhambra Mines Ltd.

OPERATOR: CANEX PLACER LIMITED, 800, 1030 West Georgia Street, Vancouver 5.

WORK DONE: Claims mapped; induced polarization survey, 1.8 line-miles; electromagnetic survey, 15.7 line-miles; magnetometer survey, 15.7 line-miles; surface diamond drilling, five holes totalling 4,676 feet on Jam 1, 3, 5, and Golden 8.

REFERENCE: Assessment Report 3617.

JAM, TT (No. 180, Fig. B)

LOCATION: Lat. 50° 41′ Long. 120° 35′-39′ (92I/10E)
KAMLOOPS M.D. At approximately 1,300 feet elevation parallel to and 1 mile southwest of the Trans-Canada Highway, 12 miles west of Kamloops.

CLAIMS: JAM, TT, CAN, totalling approximately 80.

ACCESS: By road from the Trans-Canada Highway, 1 mile.

OWNER: BOW RIVER RESOURCES LTD., 333, 885 Dunsmuir Street, Vancouver 1.

DESCRIPTION: The property is underlain by Upper Triassic Nicola volcanic rocks, Cherry Creek intrusive rocks, and Kamloops Group volcanic rocks of Miocene or earlier age.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Jam and TT claims; magnetometer survey, 27 line-miles covering TT claims; induced polarization survey, 27 line-miles covering TT claims; induced polarization survey, 56 line-miles covering Jam and Can claims; surface diamond drilling, five holes totalling 1,501 feet.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 238 (YR); Assessment Reports 2138, 4004, 4005, 4006.

TT (No. 28, Fig. B)

LOCATION: Lat. 50° 40′-42′ Long. 120° 31.5′-34′ (92I/10E)
KAMLOOPS M.D. Between 2,200 and 2,700 feet elevation on the north side of the Trans-Canada Highway, 10 miles west of Kamloops.

CLAIMS: TT 1 to 28, 56, 58 to 60, 65 to 67, 89 to 102; NORTHAIR 1 to 11 Fractions.

ACCESS: By farm roads from the Trans-Canada Highway, 4 miles.

OWNERS: NORTHAIR MINES LTD. and WHITE RIVER MINES LTD., 333, 885 Dunsmuir Street, Vancouver 1.

DESCRIPTION: The major portion of the claims is believed to be underlain by a thick series of volcanic flows with interbedded and overlying sedimentary rocks known as the Kamloops Group of Miocene or earlier age which overlie rocks related to the Iron Mask batholith.

WORK DONE: Claims and topography mapped; surface geological mapping, 1 inch equals 400 feet covering all TT claims; induced polarization survey, 51 line-miles covering all TT claims; magnetometer survey, 51 line-miles covering all TT claims; geochemical survey, 50 samples covering TT 9, 13-16; surface diamond drilling, seven holes totalling 4,135 feet on TT 1, 3, 9, and 15; percussion drilling, four holes totalling 850 feet on TT 13, 15, and 65.

REFERENCES: Assessment Reports 3824, 3890.

LIL, PINE (No. 175, Fig. B)

LOCATION: Lat. 50° 41'-44' Long. 120° 37.5'-40.5' (92I/10E)
KAMLOOPS M.D. On Duffy Creek, south of Highway 1, 15 miles west of Kamloops.

CLAIMS: LIL, PINE, totalling 65 (in part former YR claims).

ACCESS: By Highway 1 and the Beaton Lake road from Kamloops.

OWNER: FALAISE LAKE MINES LTD., 420 Howe Street, Vancouver 1.

WORK DONE: Induced polarization survey covering Lil 5-18, 24, 26-29 and Pine 1-12; surface diamond drilling, 600 feet.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 238 (YR); Assessment Reports 2138, 4012.

SAGE, HILL (No. 177, Fig. B)

LOCATION: Lat. 50° 41'-43' Long. 120° 49'-51' (92I/10E)
KAMLOOPS M.D. From Cherry Creek northeastward to Kamloops Lake, 11 miles west of Kamloops.

CLAIMS: SAGE 1 to 6, 8, 9, 11 to 16, SAGE 17 Fraction, HILL 1 to 7, 16 to 21, HILL 10 to 15 Fractions.

ACCESS: By the Trans-Canada Highway from Kamloops, 14 miles.

OWNER: CAMBRIDGE MINES LTD., 420 Howe Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Most of the property is underlain by Miocene or earlier volcanic rocks of the Kamloops Group. Minor copper sulphide mineralization occurs in fracture zones in Cherry Creek intrusive rocks, and in Nicola Group volcanic rocks.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; induced polarization survey, 4.2 line-miles covering Hill 1-5, 10 Fraction and Sage 11 to 16; geochemical soil survey, 340 samples covering all claims.

REFERENCE: Assessment Report 4011.

HY (No. 210, Fig. B)

LOCATION: Lat. 50° 41.3′ Long. 120° 40′ (92I/10E)
KAMLOOPS M.D. At approximately 2,500 feet elevation on Duffy Creek, 2.5 miles south of the Trans-Canada Highway and 14.5 miles west of Kamloops.
CLAIMS: HY 1 to 20.
ACCESS: By road from Kamloops, approximately 16 miles.
OPERATOR: SHASTA MINES & OIL LTD., 309, 890 West Hastings Street, Vancouver 1.
DESCRIPTION: The property is underlain by Nicola Group volcanic rocks.
WORK DONE: Claims mapped; induced polarization survey, 2.3 line-miles covering Hy 1-4, 11, 12, 17-20; magnetometer survey, 17.5 line-miles and geochemical survey, 700 samples covering Hy 1-12, 15-20.

WINDOW (No. 207, Fig. B)

LOCATION: Lat. 50° 42′ Long. 120° 37′ (92I/10E)
KAMLOOPS M.D. Along the south side of the Trans-Canada Highway, 13 miles west of Kamloops.
CLAIMS: WINDOW 1 to 28.
ACCESS: By secondary roads from the Trans-Canada Highway.
OWNER: BRYCON INDUSTRIES LTD., 1700, 777 Hornby Street, Vancouver 2.
WORK DONE: Magnetometer, induced polarization, and reconnaissance geological surveys.
REFERENCES: Assessment Reports 4112, 4113.

TAG (No. 211, Fig. B)

LOCATION: Lat. 50° 42′ Long. 120° 41′ (92I/10E)
KAMLOOPS M.D. On the west side of Duffy Creek, 3 miles south of the Trans-Canada Highway and 15.5 miles west of Kamloops.
CLAIMS: TAG 1 to 28, TAG 2 and 3 Fractions.
ACCESS: By road from Kamloops, 17 miles.
OPERATOR: HIGHLAND LODE MINES LTD., 728, 510 West Hastings Street, Vancouver 2.
WORK DONE: Surface diamond drilling, two holes totalling 884 feet on Tag 2.

RPM (No. 172, Fig. B)

LOCATION: Lat. 50° 42′ Long. 120° 32′ (92I/10E)
KAMLOOPS M.D. Along the south shore of Kamloops Lake, from 8 to 12 miles west of Kamloops.
CLAIMS: RPM 1 to 4, 9 to 36, VOY 1 to 20, WET 1 to 20.
ACCESS: By trail from the Trans-Canada Highway, 6 miles.

(92I/10E)

OPERATOR: TRICENTROL CANADA LIMITED, 2640, One Calgary Place, 330 Fifth Avenue SW., Calgary, Alta.

WORK DONE: Percussion drilling, nine holes totalling 3,080 feet on RPM 2, 4, 16, 18, and 25.

COPPER KING (No. 29, Fig. B)

LOCATION: Lat. 50° 42.5' Long. 120° 35.7' (92I/10E)
KAMLOOPS M.D. At approximately 1,600 feet elevation on Roper Hill and along Cherry Creek, 12 miles west of Kamloops.

CLAIMS: COPPER KING (Lot 1457), NORAH, BETA, GLEN IRON, PEGGY (Lots 1413 to 1416), NIPPON Fraction, BRITTANNIA Fraction, SIGNORINA, KLONDYKE, COPPER JACK, PEACOCK, PRINCE OF WALES, TUNNEL Fraction (Lots 2553 to 2560) plus the located claims LAKE 1 to 12, 15 to 24, CAD 2 to 4, 5, CAD 1 Fraction, BEV 1 to 12, 16 to 20, BOB 1 to 10, 13, BILL 1 to 33.

ACCESS: Adjacent to the Trans-Canada Highway, 12 to 16 miles west of Kamloops.

OWNER: Rolling Hills Copper Mines Limited.

OPERATOR: TORWEST RESOURCES (1962) LTD., 700, 1177 West Hastings Street, Vancouver 1.

METALS: Copper, gold, silver, iron.

DESCRIPTION: Mineralization consists of pyrite, chalcopyrite, and bornite which occurs in a steeply dipping north-northwesterly trending zone of intrusive rocks of the Cherry Creek assemblage that have been strongly replaced by K-feldspar and laced by magnetite veinlets. Percussion and diamond drilling indicate this zone to be approximately 500 feet long, 80 feet wide, and 200 feet deep.

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 400 feet and 1 inch equals one-quarter mile covering all claims; underground geological mapping on Copper King; electromagnetic survey, 20.1 line-miles and magnetometer survey, 20.1 line-miles covering all claims except Bev; induced polarization survey, 33.1 line-miles covering all claims; geochemical survey, 1,343 samples covering all claims; surface diamond drilling, 15 holes totalling 7,632 feet on Klondyke, Bill 19, Signorina, Copper King, Brittannia Fraction, and Bill 10; percussion drilling, seven holes totalling 1,865 feet on Bill 10, Beta, Norah, and Cad 2, 3, and 4.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1930, p. 194; Assessment Reports 3800, 3801, 3822, 3823.

HARD (No. 31, Fig. B)

LOCATION: Lat. 50° 42.5' Long. 120° 42.5' (92I/10E)
KAMLOOPS M.D. Five miles southeast of Savona, west of Brussels Creek.

CLAIMS: HARD 11 to 23, 1 to 6 Fractions.

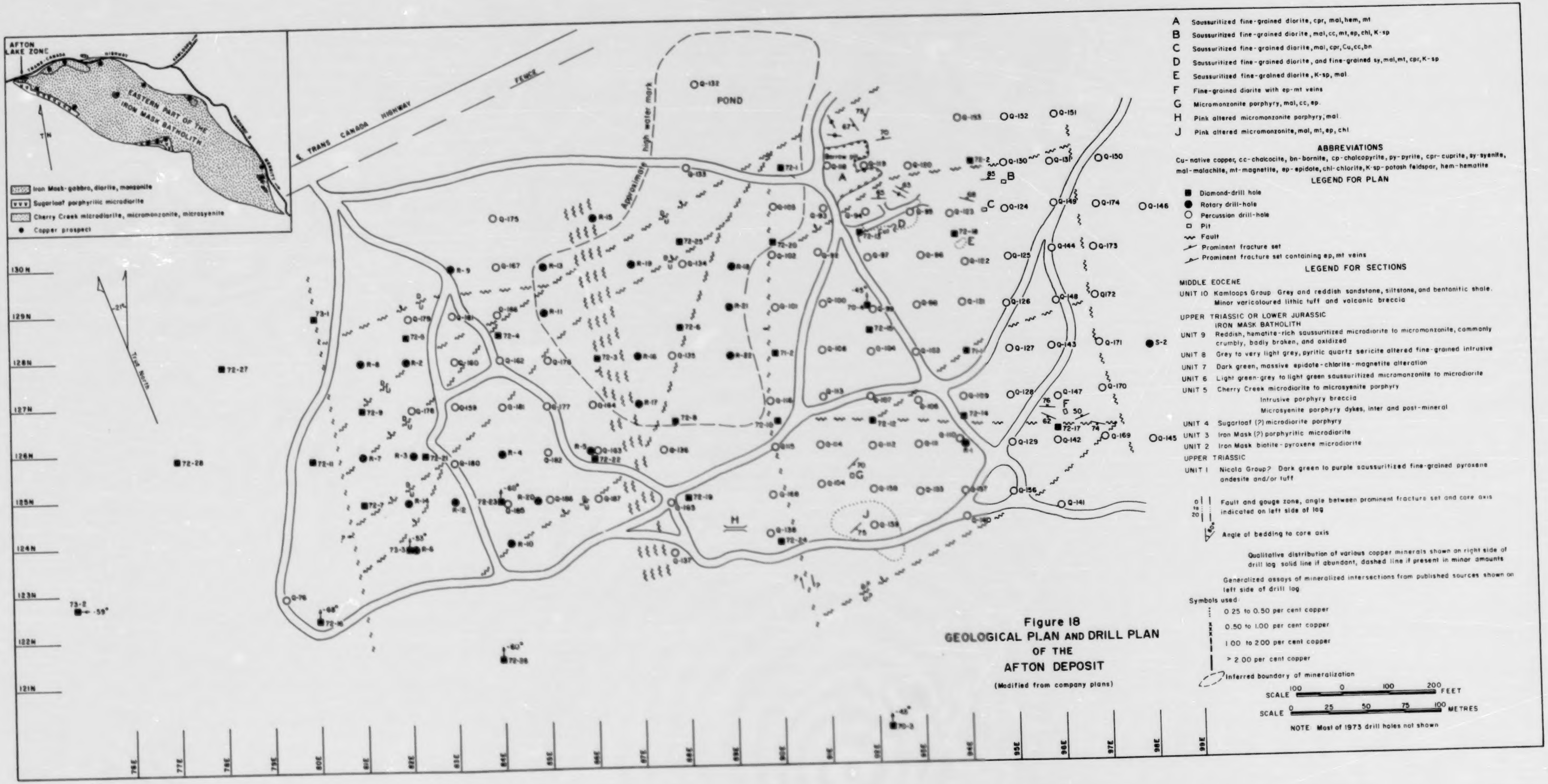

AFTON LAKE ZONE
TRANS CANADA HIGHWAY
KAMLOOPS
EASTERN PART OF THE IRON MASK BATHOLITH
T N
Iron Mask-gabbro, diorite, monzonite
Sugarloaf porphyritic microdiorite
Cherry Creek microdiorite, micromonzonite, microsyenite
Copper prospect
FENCE
TRANS CANADA HIGHWAY
Approximate high water mark
POND
True North
21°
130N
129N
128N
127N
126N
125N
124N
123N
122N
121N
76E
77E
78E
79E
80E
81E
82E
83E
84E
85E
86E
87E
88E
89E
90E
91E
92E
93E
94E
95E
96E
97E
98E
99E
A
B
C
D
E
F
G
H
J
A Saussuritized fine-grained diorite, cpr, mal, hem, mt
B Saussuritized fine-grained diorite, mal, cc, mt, ep, chl, K-sp
C Saussuritized fine-grained diorite, mal, cpr, Cu, cc, bn
D Saussuritized fine-grained diorite, and fine-grained sy, mal, mt, cpr, K-sp
E Saussuritized fine-grained diorite, K-sp, mal
F Fine-grained diorite with ep-mt veins
G Micromonzonite porphyry, mal, cc, ep.
H Pink altered micromonzonite porphyry, mal.
J Pink altered micromonzonite, mal, mt, ep, chl
ABBREVIATIONS
Cu-native copper, cc-chalcocite, bn-bornite, cp-chalcopyrite, py-pyrite, cpr-cuprite, sy-syenite, mal-malachite, mt-magnetite, ep-epidote, chl-chlorite, K-sp-potash feldspar, hem-hematite
LEGEND FOR PLAN
■ Diamond-drill hole
● Rotary drill-hole
○ Percussion drill-hole
□ Pit
Fault
Prominent fracture set
Prominent fracture set containing ep, mt veins
LEGEND FOR SECTIONS
MIDDLE EOCENE
UNIT 10 Kamloops Group Grey and reddish sandstone, siltstone, and bentonitic shale. Minor varicoloured lithic tuff and volcanic breccia
UPPER TRIASSIC OR LOWER JURASSIC
IRON MASK BATHOLITH
UNIT 9 Reddish, hematite-rich saussuritized microdiorite to micromonzonite, commonly crumbly, badly broken, and oxidized
UNIT 8 Grey to very light grey, pyritic quartz sericite altered fine-grained intrusive
UNIT 7 Dark green, massive epidote-chlorite-magnetite alteration
UNIT 6 Light green-grey to light green saussuritized micromonzonite to microdiorite
UNIT 5 Cherry Creek microdiorite to microsyenite porphyry
Intrusive porphyry breccia
Microsyenite porphyry dykes, inter and post-mineral
UNIT 4 Sugarloaf (?) microdiorite porphyry
UNIT 3 Iron Mask (?) porphyritic microdiorite
UNIT 2 Iron Mask biotite-pyroxene microdiorite
UPPER TRIASSIC
UNIT 1 Nicola Group? Dark green to purple saussuritized fine-grained pyroxene andesite and/or tuff
0 to 20
Fault and gouge zone, angle between prominent fracture set and core axis indicated on left side of log
60°
Angle of bedding to core axis
Qualitative distribution of various copper minerals shown on right side of drill log solid line if abundant, dashed line if present in minor amounts
Generalized assays of mineralized intersections from published sources shown on left side of drill log
Symbols used:
0.25 to 0.50 per cent copper
0.50 to 1.00 per cent copper
1.00 to 2.00 per cent copper
> 2.00 per cent copper
Inferred boundary of mineralization
SCALE 100 0 100 200 FEET
SCALE 0 25 50 75 100 METRES
NOTE: Most of 1973 drill holes not shown

Figure 18
GEOLOGICAL PLAN AND DRILL PLAN
OF THE
AFTON DEPOSIT

(Modified from company plans)

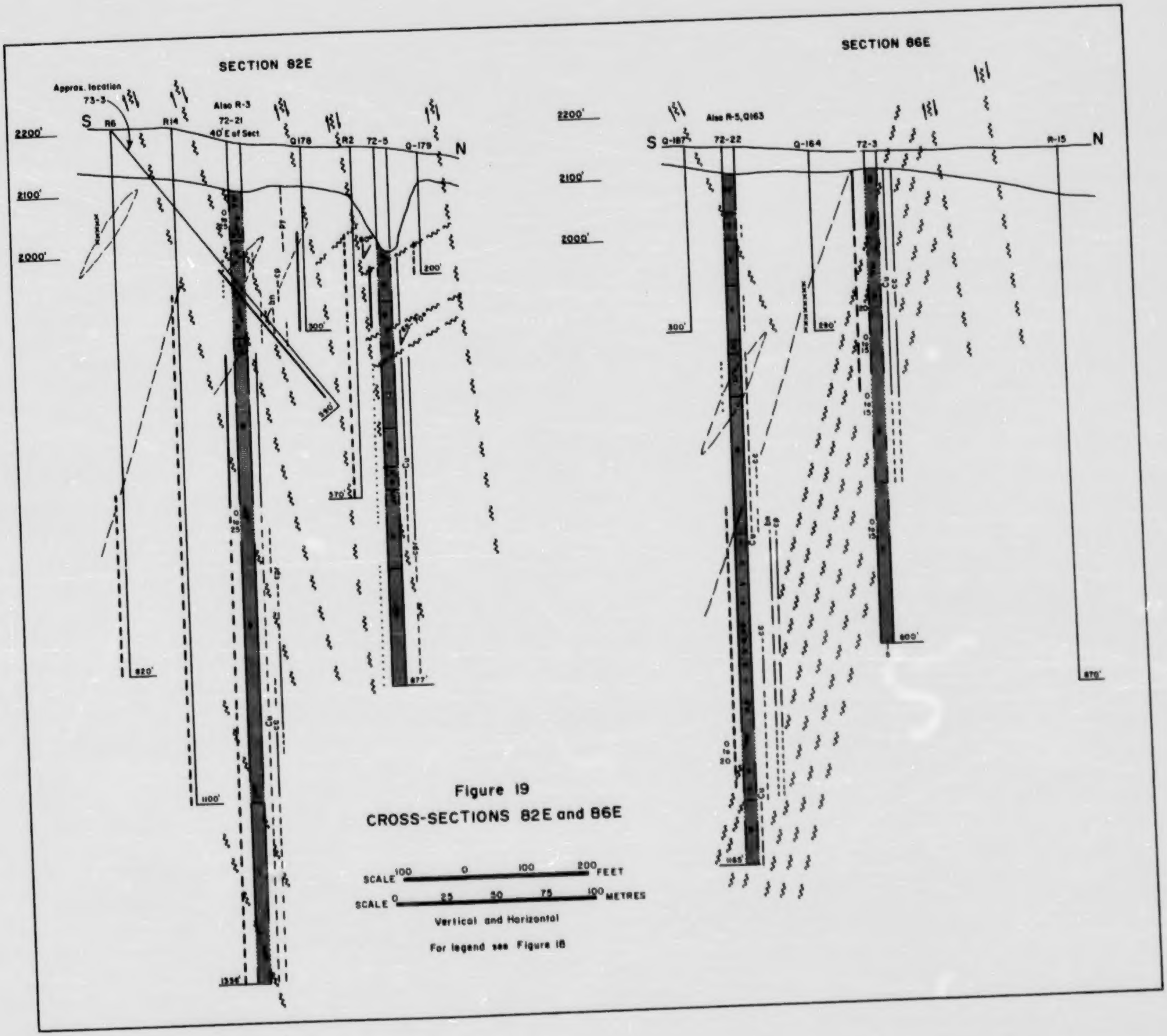

SECTION 82E
Approx. location 73-3
S
R6
R14
Also R-3
72-21
40'E of Sect.
Q178
R2
72-5
Q-179
N
2200'
2100'
2000'
330'
300'
370'
200'
820'
1100'
877'
1356'
Cu
SECTION 86E
2200'
2100'
2000'
S
Q-187
Also R-5, Q163
72-22
Q-164
72-3
R-15
N
300'
290'
900'
870'
1165'
Cu
SCALE 100 0 100 200 FEET
SCALE 0 25 50 75 100 METRES

Figure 19

CROSS-SECTIONS 82E and 86E

Vertical and Horizontal

For legend see Figure 18

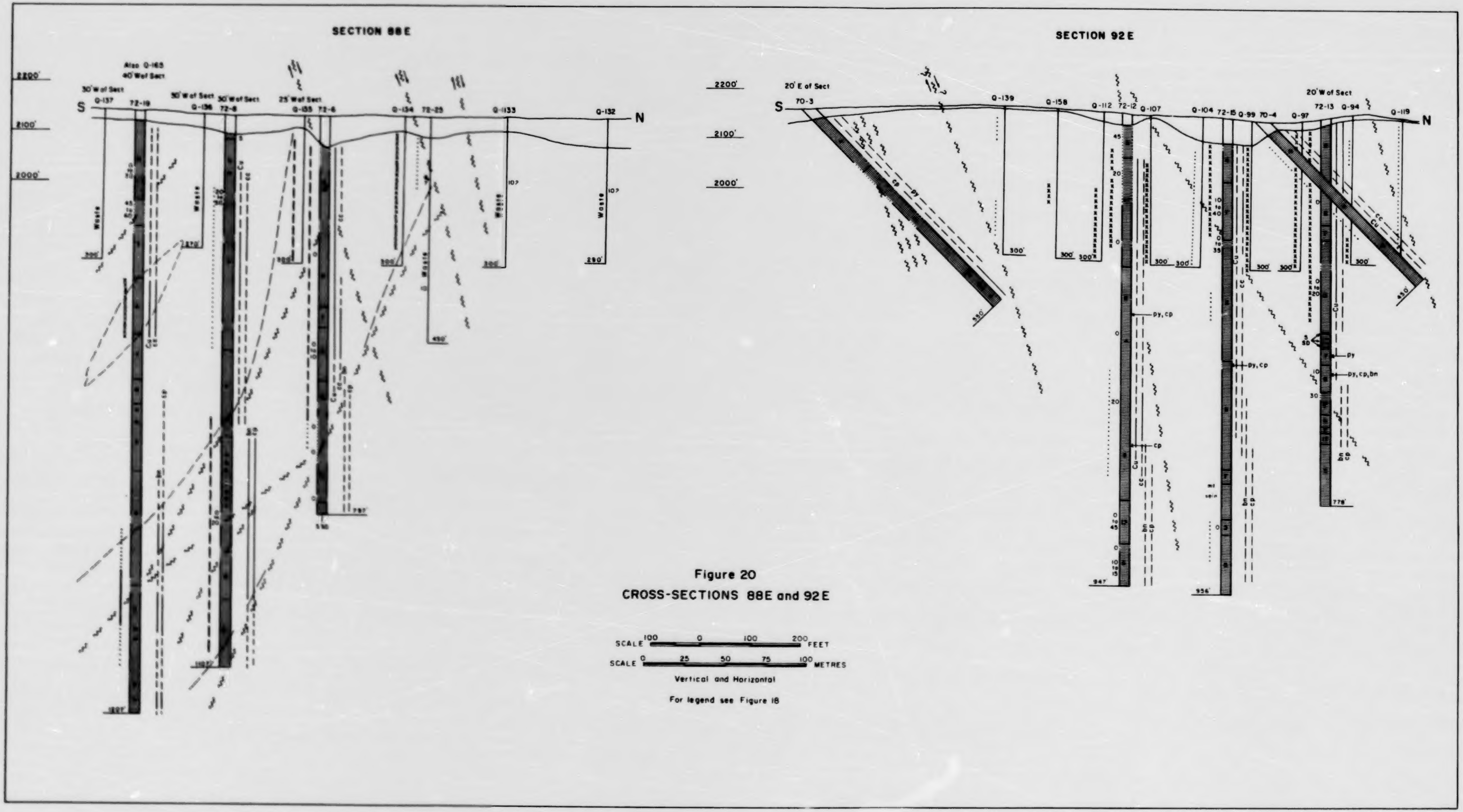

SECTION 88E
SECTION 92E
2200'
2100'
2000'
S
N
Also Q-165
40' W of Sect
30' W of Sect
Q-137
72-19
30' W of Sect
Q-136
30' W of Sect
72-8
25' W of Sect
Q-135
72-6
Q-134
72-25
Q-1133
Q-132
Waste
300'
270'
290'
450'
1109'
1102'
797'
530
20' E of Sect
70-3
Q-139
Q-158
Q-112
72-12
Q-107
Q-104
72-15
Q-99
70-4
Q-97
20' W of Sect
72-13
Q-94
Q-119
550'
450'
947'
956'
778'
Cu
cc
cp
py
bn
py, cp
py, cp, bn
mt
vein

Figure 20

CROSS-SECTIONS 88E and 92E

SCALE 100 0 100 200 FEET

SCALE 0 25 50 75 100 METRES

Vertical and Horizontal

For legend see Figure 18

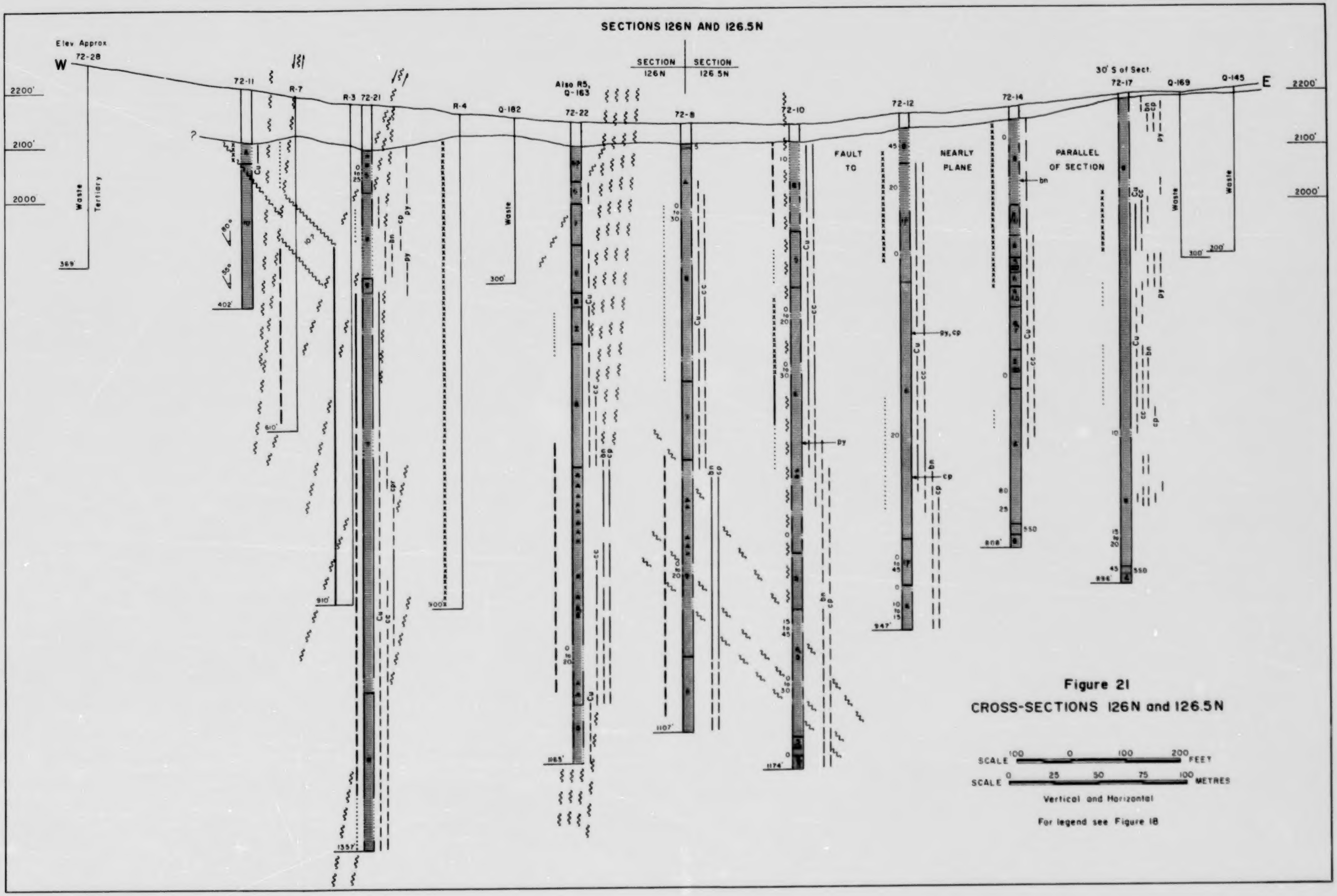

SECTIONS 126N AND 126.5N
SECTION 126N
SECTION 126.5N
Elev Approx
W
E
2200'
2100'
2000'
72-28
72-11
R-7
R-3
72-21
R-4
Q-182
Also R5, Q-163
72-22
72-8
72-10
72-12
72-14
30' S of Sect.
72-17
Q-169
Q-145
Waste
Tertiary
FAULT TO
NEARLY PLANE
PARALLEL OF SECTION
Cu
cc
bn
cp
py
py, cp
369'
402'
610'
910'
900'
300'
1357'
1163'
1107'
1174'
947'
808'
896'
300'
200'
550
550
SCALE 100 0 100 200 FEET
SCALE 0 25 50 75 100 METRES

Figure 21

CROSS-SECTIONS 126N and 126.5N

Vertical and Horizontal

For legend see Figure 18

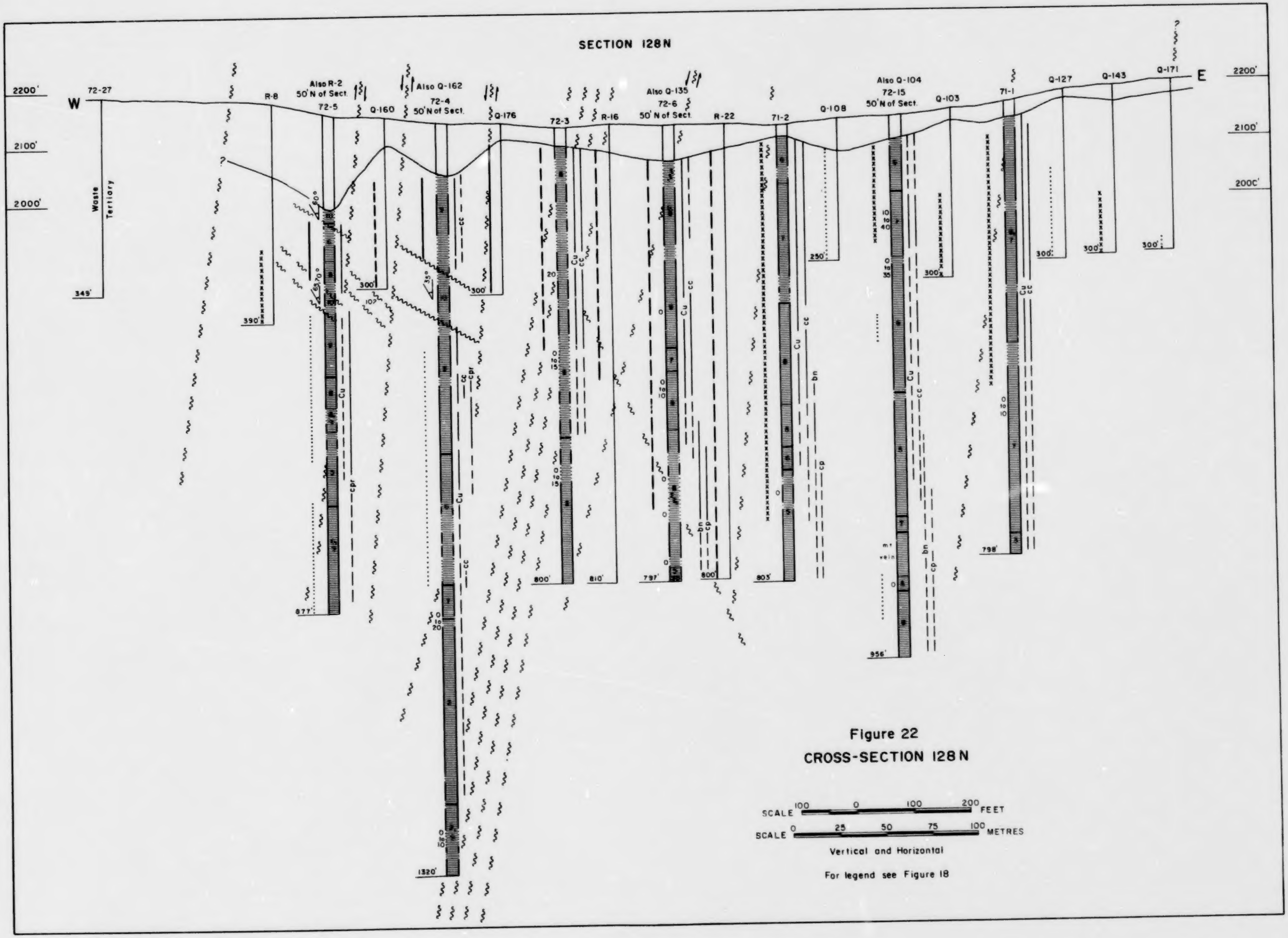

SECTION 128N
W
E
2200'
2100'
2000'
72-27
Waste
Tertiary
349'
R-8
390'
Also R-2
50'N of Sect.
72-5
60°
70°
877'
Cu
cpr
Q-160
300'
Also Q-162
72-4
50'N of Sect.
35°
300'
cc
cpr
Cu
cc
0 to 20
0 to 10
1320'
Q-176
300'
72-3
20
0 to 15
0 to 15
Cu
cc
800'
R-16
810'
Also Q-135
72-6
50'N of Sect.
0
0 to 10
Cu
cc
bn
cp
797'
R-22
800'
71-2
Cu
cc
bn
cp
805'
Q-108
250'
Also Q-104
72-15
50'N of Sect.
10 to 40
0 to 35
Cu
cc
mt vein
bn
cp
956'
Q-103
300'
71-1
0 to 10
Cu
cc
798'
Q-127
300'
Q-143
300'
Q-171
300'
?
SCALE 100 0 100 200 FEET
SCALE 0 25 50 75 100 METRES

Figure 22

CROSS-SECTION 128N

Vertical and Horizontal

For legend see Figure 18

(92I/10E)

ACCESS: By Highway 1 from Kamloops.

OWNER: CONSOLIDATED CLEVELAND RESOURCES LTD. (formerly Cleveland Mining & Smelting Co. Ltd.), 615, 850 West Hastings Street, Vancouver 1.

WORK DONE: Line-cutting; geological mapping, 1 inch equals 400 feet; electromagnetic survey; magnetometer survey; geochemical survey, 1,705 samples.

REFERENCE: Assessment Report 3715.

HILLTOP, SAGE (No. 258, Fig. B)

LOCATION: Lat. 50° 44.7' Long. 120° 37.8' (92I/10E)
KAMLOOPS M.D. Between 1,300 to 2,500 feet elevation at Fredrick Siding on the north side of Kamloops Lake, 14 miles west-northwest of Kamloops.

CLAIMS: HILLTOP, SAGE, FS, etc., totalling 11.

ACCESS: By road from Kamloops.

OPERATOR: ATTILA RESOURCES LTD., 837, 613 West Hastings Street, Vancouver 2.

METAL: Copper.

DESCRIPTION: The Fredrick Siding showings occur in fine-grained diorite, monzonite, and syenite porphyries of the Cherry Creek intrusions which cut Iron Mask diorite and monzonite. To the west these intrusive rocks cut Upper Triassic Nicola volcanic rocks. Both the intrusive and Nicola Group rocks are unconformably overlain by Middle Eocene Tranquille sedimentary rocks and Kamloops Group volcanic rocks. The showings, on a prominent knoll known as The Knob, consist of chalcopyrite and pyrite in fine-grained monzonite and syenite porphyry and breccia. A prominent zone of alteration and faulting is followed by Doherty Creek immediately west of The Knob.

WORK DONE: Road construction, one-half mile; trenching, 200 feet on Hilltop 3; stripping, 200 feet on Hilltop 3; surface diamond drilling, three holes totalling 1,400 feet on Hilltop 3.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 239; Assessment Report 2353.

AFTON, POTHOOK (No. 169, Fig. B)

By V. A. Preto

LOCATION: Lat. 50° 39.5' Long. 120° 30.5' (92I/10E, 9W)
KAMLOOPS M.D. At approximately 2,100 feet elevation 8 miles west of Kamloops on the south side of the Trans-Canada Highway.

CLAIMS: AFTON 1 to 7, AFTON Fraction, ADD 1 to 30, POT 5 to 9, POT 1 to 4 and 10 Fractions, ADD 1 Fraction, AD 1 Fraction, BERNIE 7 and 8 Fractions, Mineral Lease M-22 (DOMINION, Lot 1595).

ACCESS: By the Trans-Canada Highway from Kamloops, 10 miles.

OWNER: Afton Mines Ltd.

(92I/10E, 9W)

OPERATORS: AFTON MINES LTD., Box 34183, Station D, Vancouver 9 and CANEX PLACER LIMITED, 800, 1030 West Georgia Street, Vancouver 5.

METAL: Copper.

DESCRIPTION:

HISTORY: Copper mineralization in the area of the Afton claims has been known at least since 1898 when the 330-foot Pothook shaft and several pits and trenches were excavated. This shaft, and its immediate surroundings, located approximately 3,500 feet southeast of the presently known Afton orebody, remained the focus of exploration activity in this area for many years. In 1949 a prospector named Axel Berglund staked eight claims near the Pothook shaft and called them 'Afton' which means 'afternoon' in Swedish (Millar, 1973, p. 33). Since then the property and its surroundings were investigated by Kennecott Copper Corporation in 1952, Graham Bousquet Gold Mines Limited in 1956-57, Noranda Mines, Limited in 1958, and New Jersey Zinc Exploration Company (Canada) Ltd. in 1960. During this period an appreciable amount of diamond drilling, geological, geophysical, and geochemical surveys were done on the property, but mostly in the vicinity of the Pothook shaft.

In 1964, C. F. Millar, a geological engineer who was then a drilling contractor, persuaded Colonial Mines Ltd. to do percussion drilling near the Pothook shaft. This programme was short lived and in 1965 Mr. Millar formed a private syndicate to continue exploration near the Pothook and on some newly staked claims close to the Trans-Canada Highway. Between 1965 and 1967 this syndicate did a considerable amount of percussion drilling and a fairly extensive induced polarization survey. In 1967 a consultant's report recommended a diamond-drill-hole programme, part of which was completed by 1970. Among these holes, DDH 70-4 was drilled on a small induced polarization 'high' in the east half of the presently known orebody. This hole intersected 250 feet of .41 per cent copper in a zone of strong magnetite veining and of several old pits in which magnetite and minor copper mineralization is visible. The diamond-drill programme was suspended incomplete and Duval Corporation was given the right of first refusal in exchange for an engineering report (Millar, 1973, p. 34) which recommended further diamond drilling. In 1970-71 the property was optioned by Quintana Minerals Corporation which relinquished the option in the summer of 1971 after having drilled several unsuccessful percussion holes over a large part of the property.

At this point the property reverted back to Afton Mines Ltd. which, under the direction of C. F. Millar, in September 1971 began a new series of percussion holes in the immediate vicinity of DDH 70-4, the only hole to that date that had shown any significant mineralization. Most holes in this new series encountered significant mineralization, both as native copper and as sulphides, and several of them were stopped in ore-grade material. Late in 1971 diamond and rotary rigs were added to the percussion machines and the programme continued until June 1972 when work on the property was suspended by a court order due to a litigation between Canex Placer Limited and Teck Corporation Ltd. over control of the property. During the period of September 1971 to June 1972, 24,281 feet in 30 diamond holes, 27,900 feet in 93 percussion holes, and 19,365 feet in 26 rotary drill holes were completed.

Following a verdict from the Supreme Court of British Columbia in December 1972, diamond drilling was resumed on the property early in 1973 under the management of

Canex Placer Limited. The litigation at this time is however not finished as Teck Corporation Ltd. has appealed the court decision.

Drilling to June 1972 has indicated an orebody which is estimated to contain 31,600,000 tons of 1.06 per cent copper ore with a stripping ratio of 3.26 to 1 or 47,000,000 tons of 0.79 per cent ore with a stripping ratio of 4.55 to 1, both estimates being based on a 0.25 per cent copper cut-off (Millar, 1973, p. 34). The ore zone is still not defined down dip to the south and to the west, although it appears to be also becoming rapidly less accessible to open-pit mining in these directions. The average thickness of overburden as calculated from 22 rotary and 27 vertical diamond-drill holes over the entire area drilled was 58 feet.

LOCATION: The orebody is centred approximately 600 feet south of the Trans-Canada Highway, some 8 miles west of Kamloops in an area of rolling sagebrush and grassland dotted with ephemeral alkali ponds. One of these ponds directly overlies the orebody (Plate IV) which is thus known as the Lake Zone.

GEOLOGY

General Setting: The orebody lies on the extreme northwestern edge of the eastern part of the Iron Mask batholith. The close association of copper deposits to the contact zones of this batholith or to major structural breaks through it has long been known. So has been their close relationship to late porphyritic phases of the batholith that are found almost exclusively in these relatively narrow and well-defined zones (*Minister of Mines, B.C.,* Ann. Rept., 1967, pp. 137-147). In these respects the Afton is similar to several other copper deposits of the Iron Mask batholith. Its main difference, however, is in its larger size, higher primary grade and supergene enrichment.

Structurally the deposit lies along the southern edge of an east-west trending graben filled with several thousand feet of Middle Eocene Kamloops Group volcanic and sedimentary rocks. The ore zone itself, especially in its western end, is in fact also probably downfaulted with respect to adjacent ground to the east, and this may in part account for the preservation of supergene mineralization in this area.

Description of Rock Units: As shown on Figure 18 outcrop in the area of the Afton deposit is extremely scarce, and geological interpretation must be based largely on examination of diamond-drill core. Following examination of core from most of the diamond-drill holes shown on Figure 18, the various rock types encountered were arbitrarily subdivided into 10 units mostly on the basis of their outward appearance and inferred age. These units range from possible fine-grained volcanic rocks of the Nicola Group to medium-grained diorite of the Iron Mask batholith, fine-grained diorite, monzonite, and syenite porphyry of the Cherry Creek intrusions, and Middle Eocene volcanic and sedimentary rocks of the Kamloops Group. A brief description of these units follows.

UNIT 1: Rocks that could be recrystallized tuff and possibly lava of the Nicola volcanic succession are found on section 92E in drill holes 72-12 and 72-13 (Fig. 20). This material is fine to medium-grained, greenish to purple andesite, moderately to strongly saussuritized and completely devoid of K-feldspar. These possible volcanic rocks occur as relatively short sections in altered intrusive rocks of unit 6, and probably represent inclusions of Nicola country rock near the edge of the batholith.

Plate IV.   Drilling at the Afton deposit, looking west (June 1972).

UNIT 2: Medium-grained, non-porphyritic, strongly magnetic greenish grey biotite pyroxene diorite is found as relatively short sections in several drill holes. On the basis of general appearance and texture, this rock is believed to be part of the microdiorite division of the Iron Mask batholith (*Minister of Mines, B.C.,* Ann. Rept., 1967, pp. 137-147). As seen in the drill holes, this unit can be weakly to strongly saussuritized and fractured, and barren to moderately well mineralized.

UNIT 3: Medium-grained diorite mapped as unit 3 is found occasionally in some drill holes. This rock is very similar in composition to diorite of unit 2 but is generally slightly porphyritic. It is probably a transitional or contact phase of unit 2.

UNIT 4: A rock type mapped sparately as unit 4 and probably correlative to a phase of the Sugarloaf intrusions (*Minister of Mines, B.C.,* Ann. Rept., 1967, pp. 137-147) is found in the upper part of drill hole 70-3 on section 92E (Fig. 20). This is a grey to pinkish-grey hornblende microdiorite to micromonzonite porphyry which occasionally contains small inclusions of darker, more mafic material. The porphyry is weakly mineralized with pyrite and chalcopyrite and moderately saussuritized.

UNIT 5: Rocks mapped as unit 5 are part of the Cherry Creek intrusions and are thought to have played an essential role in the formation of the deposit. They, and what are believed to be their altered equivalents, units 6, 8, and 9, are by far the most common in the Afton deposit. Sections designated as unit 5 in the drill holes include porphyries or micro-porphyries of diorite to syenite composition which have preserved their original texture as they have only been weakly or moderately altered. The bulk of unit 5 consists of fine-grained porphyries that range in colour from dark greenish to brownish and pinkish grey and in composition from microdiorite to micromonzonite. They are weakly to moderately altered but almost invariably strongly magnetic. These porphyries grade toward more strongly altered sections of equivalent rock that are designated as unit 6. A very important part of unit 5 is intrusive breccia, which is best displayed in drill holes 72-22, 72-19, and 72-8, but is also found in several other holes. This breccia is believed to have formed at relatively shallow depth during the emplacement of the Cherry Creek suite of porphyries, and is very similar in outward appearance to other bodies of breccia found at several other localities along the northern edge of the Iron Mask batholith. It consists of moderately to well-rounded fragments of fine-grained porphyry which are unevenly distributed in a fine-grained commonly brownish and biotite-rich matrix, and is nearly everywhere well mineralized. The bulk of the breccia appears to form a roughly tabular to lensoid body, some 200 feet thick, elongated in an east-west direction and dipping steeply to the south. The Afton deposit as presently known seems to be centred on this body of breccia and on highly altered rock of units 6 and 9 which may well be largely equivalent to it.

Most of unit 5 is mineralized, but several small late, relatively fresh, microsyenite dykes are found in some drill holes such as 72-10, 72-12, 72-14, and 72-17 in the eastern part of the deposit. These dykes are only weakly mineralized or barren and appear to cut more altered and better mineralized rocks of units 5 and 6, and also contain rare inclusions of diorite of units 2 and 3. These dykes, though somewhat late to post-mineral in age, are considered to be genetically part of unit 5 and are thus mapped as such but designated by the letters SD in the drill sections.

UNIT 6: Rocks mapped as unit 6 are also very common in the deposit. They consist of light green, green-grey, and pinkish saussuritized rock, much of which is thought to be correlative with unit 5. Alteration has however largely or totally destroyed original textures so that features useful in correlating with other units can only rarely be identified. Sections of altered porphyry breccia or of porphyry can however be recognized in some places, indicating that at least part of this unit is equivalent to unit 5. The alteration varies in intensity from place to place but generally consists of strong to total replacement by sericite, albite, epidote, and carbonate with variable amounts of chlorite, zoisite, apatite, sphene, and rarely pyroxene. K-feldspar replacement is not as common as it might appear in hand specimen, for much of the pink material seen is actually thought to be albite coloured by finely disseminated hematite. Biotite, either primary as in rocks of unit 2 and some of unit 5 or finely disseminated and secondary as in some parts of unit 5 is destroyed by the saussuritic alteration characteristic of unit 6, as is primary finely disseminated magnetite which is re-introduced in veins that are commonly found in the eastern part of the deposit cutting rocks of both units 6 and 7.

UNIT 7: Rocks mapped as unit 7 are intensely altered and consist of massive fine to coarse-grained epidote-chlorite-magnetite replacement of saussuritized rock of unit 6. They generally occur in the eastern half of the deposit and rarely are a good host for mineralization. Patches and veins of massive magnetite with conspicuous apatite crystals and minor amounts of calcite, quartz, and siderite are common within this unit and may occasionally give drill intersections of considerable length such as at the bottom of hole 72-15 on section 128N. The veins, however, dip very steeply and are nearly parallel to the drill holes so that their actual thickness is considerably less than the length of the drill-hole intersections. Similarly it would appear that the intensely altered zones of unit 7 probably also form steeply dipping to subvertical shoots which contain the magnetite veins and probably trend, as the veins do, in an easterly to southeasterly direction as indicated by measurements taken in the few exposures in the northeastern part of the deposit and in drill holes 70-4 and 72-13.

UNIT 8: Material designated as unit 8 consists of totally altered light grey to buff quartz sericite rock with an appreciable amount of pyrite and some chalcopyrite. Unit 8 is known to occur only in the intensely faulted western part of the deposit such as at the top of hole 72-16 and in the upper part of hole 72-21. Rocks of unit 8 appear invariably to be in fault contact with rocks of unit 9, and may represent blocks that have been faulted in their present position from a considerable distance perhaps from the south and west.

UNIT 9: The red, hematitic, crumbly rock comprising unit 9 is perhaps one of the more widely known rock types of the Afton deposit because of its spectacular native copper mineralization. This unit is typical of the strongly faulted and oxidized western half of the deposit and is known to occur only west of section 88E (Figs. 18, 21, and 22). Its chief characteristics are the abundance of brick red to reddish brown earthy hematite, its generally highly friable nature and the widespread occurrence in it of native copper and cuprite. Where less oxidized and friable, this rock type is seen to consist largely of strongly saussuritized fine-grained porphyry with secondary pink feldspar, and so is also probably equivalent to unit 5.

UNIT 10: Rocks of unit 10 are entirely post-mineral in age and consist of tuff, lapilli tuff, sandstone, and minor conglomerate and bentonitic shale of the Middle Eocene

Kamloops Group. They are in fault contact with the mineralized rocks of the Afton deposit to the west and north, and also occur as fault wedges within ore in the western half of the deposit. Wherever observed these strata are completely barren and their emplacement within ore must have occurred after all movement of copper-bearing solutions through the orebody had stopped. A short distance north of the Trans-Canada Highway a few diamond-drill holes indicated a thickness of the Tertiary section in excess of 1,500 feet. Fault wedges of barren Tertiary strata within ore are found in sections 84E to 80E (Figs. 19, 21, and 22) and appear to dip moderately to the southeast and thicken to the north and west. Most of the angles between bedding and drill core axes in these intersections indicate gentle to moderate dips, but steeper dips also occur. However these may be due in part to original soft sediment folding because such structures can be seen in some of the better preserved core.

ROCK ALTERATION: Rock alteration within the Afton deposit varies greatly from place to place both in intensity and type. As indicated by some of the least altered rocks found in drill holes it appears that the earliest stage of alteration in the less calcic rocks was the development of very finely disseminated brown biotite. This stage can be seen in many parts of unit 5 but may have been completely bypassed in more calcic rocks of units 2 and 3 where saussuritic alteration appears to have developed instead. Saussuritic alteration, accompanied by chloritization of ferromagnesian minerals and in a few places by development of pink K-feldspar appears to have eventually spread to all units and in the eastern part of the deposit progressed to the development of the shoots of massive epidote-chlorite-magnetite alteration of unit 7. In the western part of the deposit the saussurite stage was followed by widespread and locally intense development of sericite which contributed to the destruction of any biotite and K-feldspar and locally produced a light grey to nearly white, totally altered rock with light greenish waxy patches of muscovite.

In the intensely fractured part of the deposit west of section 88E the saussurite and probably the sericite stage were followed by locally intense and deep reaching oxidation which produced the red hematite alteration of unit 9 as well as several secondary copper minerals. In some particularly well-fractured areas this oxidation reached considerable depths. In drill hole 72-21 for example the red hematitic alteration and native copper occur to the bottom of the hole at a depth of 1,357 feet, and cuprite, malachite, azurite, and conichalcite are found in highly oxidized rock to a depth of nearly 900 feet. Other secondary minerals that have been detected by X-ray diffraction as occurring in minor amounts in the more highly altered parts of units 8 and 9 are talc, pyrophyllite, montmorillonite, kaolinite, and jarosite.

MINERALIZATION: Using the terminology of Sutherland Brown (1969) and of Sutherland Brown, *et al.*, (1971) the Afton deposit could be defined as a complex syenitic porphyry deposit. It is however distinctive in the fact that it has undergone considerable oxidation and supergene enrichment that are especially profound west of section 85E.

East of section 85E with the exception of holes 72-22, 70-3, and 72-17, the upper 500 to 600 feet of the deposit consists of native copper-chalcocite mineralization with no bornite, chalcopyrite, or pyrite except for isolated minor occurrences in late carbonate veinlets. Conversely, the lower part of the deposit, as far as drilling has reached, consists of bornite-chalcopyrite mineralization, with minor chalcocite and no native copper. Native copper generally disappears abruptly within a few feet of the first appearance of chalcopyrite and very seldom if ever overlaps with this sulphide for any appreciable distance. Bornite, on the contrary, usually appears above chalcopyrite and commonly overlaps with the lower part of the native copper zone. Similarly, chalcocite commonly extends downwards for appreciable distances into the chalcopyrite zone.

The three diamond-drill holes mentioned above that are an exception to this rule can be explained as follows. Hole 72-22 goes through the normal sequence of native copper-chalcocite mineralization followed downwards by bornite-chalcopyrite, but in the lower part of the hole chalcocite reappears and chalcopyrite-bornite decrease markedly until at the very bottom of the hole the only mineralization is native copper in red hematitic, highly sheared and oxidized rock of unit 9. This reappearance of native copper at depth is believed to be due to the presence of a strong northerly trending shear zone which passes through the upper part of hole 72-3 and the bottom part of 72-22 and probably provided a good avenue for oxidizing solutions (Figs. 18 and 19). Hole 70-3 is weakly mineralized with pyrite and chalcopyrite throughout its length, but is located south of a fault which probably had considerable post-mineral movement and the rock here may thus have been moved in its present position from some distance away (Fig. 18). Hole 72-17 is exceptional since it has submarginal native copper-chalcocite and bornite-chalcopyrite-pyrite mineralization alternating in short sections from top to bottom (Fig. 21). However this hole is located at the extreme east end of the deposit and probably penetrated the irregular outer boundary of the enriched copper zone with the barren or nearly barren surrounding rock.

Another characteristic of the eastern part of the Afton deposit is the nearly complete absence of cuprite and the abundance, especially east of section 90E, of magnetite veins which usually contain conspicuous calcite, apatite, and minor amounts of quartz, siderite, and copper mineralization. Although some of these massive magnetite veins produce considerable intersections in some bore holes, they are believed to be only a few feet thick at the most, to dip very steeply, and for the most part to trend easterly to southeasterly, as indicated in the few surface exposures.

West of section 85E, and with the exception of holes 72-21, 72-7, and 72-16, the Afton deposit is characterized by the absence of bornite-chalcopyrite-pyrite mineralization, by a relatively small amount of chalcocite, and by a predominance of native copper and cuprite mineralization that is normally in highly fractured and oxidized rock. Copper values for this part of the orebody are also considerably higher than in the eastern half and this is a direct result of stronger and deeper secondary enrichment which was made possible by the much greater amount of fracturing and was in fact preserved perhaps because of a relative downward movement of this part of the deposit with respect to the eastern parts. Native copper typically occurs in thin seams, dendritic growths and fine disseminations. Chalcocite usually occurs along fractures or in fine disseminations. Cuprite generally occurs as red earthy coatings but may be found well crystallized in vuggy porous rock. Malachite, azurite, and conichalcite are occasionally found in some of the more deeply oxidized material and in hole 72-21 occur at a depth of approximately 900 feet. Magnetite occurs rarely as either disseminations or in veins but commonly is oxidized to hematite.

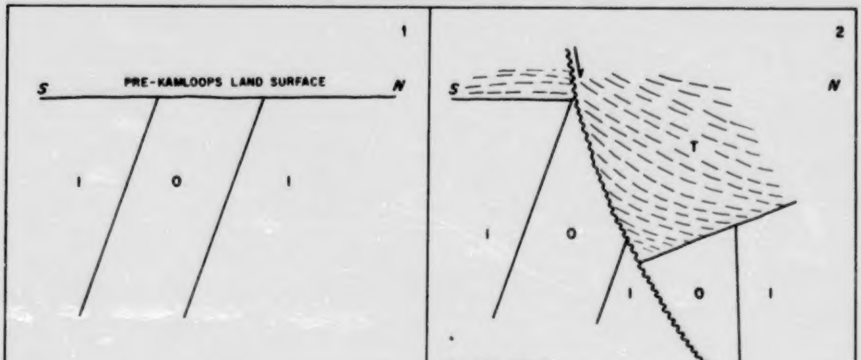
For the three diamond-drill holes mentioned above which are exceptions to these generalizations there are plausible explanations. Holes 72-21 and 72-7 have an upper zone of pyritic saussuritized and quartz-sericite altered rock which overlies in fault contact red hematitic rock mineralized with native copper, chalcocite, and cuprite. Here again it is believed that an appreciable amount of post-mineral movement has taken place and probably accounts for the juxtaposition of these incompatible mineral assemblages. Hole 72-16 has an upper portion of quartz-sericite altered rock that is mineralized with chalcopyrite and pyrite and overlies in fault contact a long section of native copper mineralization in red hematitic rock. In the lower part of the hole the native copper gives way to chalcopyrite-pyrite mineralization in somewhat less broken and altered rock which in turn is in fault contact with a bottom section of highly broken and altered material mineralized with native copper and chalcocite. The structure in the vicinity of this hole is very poorly understood partly because it is on the fringe of the drilled zone. There are indications that the hole was collared a short distance to the west of another northerly trending and probably westerly dipping shear zone or break (Fig. 18) and, if this is the case, it may have been largely drilled within or close to this zone. The upper zone of pyritic mineralization at the top of the hole could perhaps be explained in the same way as similar zones in holes 72-21 and 72-7, and the highly sheared zone of native copper-chalcocite mineralization at the bottom of the hole below the chalcopyrite-pyrite mineralization could perhaps be due to the downward projection of the northerly trending shear zone in a fashion similar to that that is believed to occur in hole 72-22.

A final feature which is common to the whole of the Afton deposit is the nearly complete lack of any capping of leached rock immediately below the cover of overburden. Many drill holes begin in ore-grade material, some of it very rich, at the onset as they enter bedrock. This is probably due to removal of any leached capping and perhaps also of a portion of the enriched native copper zone by glaciation during the Pleistocene.

STRUCTURE: A structural synthesis of the Afton deposit is difficult because the deposit is entirely in intrusive rocks, is almost completely covered by overburden, and lacks marker horizons other than the fairly regular plane that marks the bottom of the native copper zone in the eastern half.

The deposit lies on the northwestern edge of the Iron Mask batholith, an area which is known to be the locus of much faulting. The area of the deposit, and especially the western half, is however so strongly faulted, and so much of this deformation partly or totally post-dates mineralization that little can be understood at this time of the pre-mineral fault and fracture pattern. However, the ore zone as a whole and some of the rock units are thought to trend in an easterly direction and to dip steeply to the south, as do some important faults as indicated in section 88E (Fig. 20). This attitude is in part followed by magnetite veins in the eastern half of the deposit and probably parallels the general trend of several other old faults and of the northern edge of the batholith in this area. However the majority of the east-trending faults that can be identified, particularly in the western half of the deposit, are post-mineral and, in the writer's interpretation, are normal faults that dip to the north.

The distribution of Middle Jurassic and Early Tertiary rocks in south-central British Columbia has long been thought to be controlled by narrow depressed fault blocks or grabens (Carr, 1962, p. 48) and in some areas, such as in the Republic graben, a long and complex history of Early Tertiary volcanism and sedimentation accompanying the development of a graben has been well documented (Parker and Calkins, 1964). The very appreciable thickness of Kamloops Group sedimentary and volcanic rocks that is known to occur immediately north of the Trans-Canada Highway in an area of nearly flat topography must have been preserved from erosion by down-faulting relative to the block occupied by the Iron Mask batholith. It is further suggested that the Kamloops Group may have been deposited in this graben during its development, and that the wedges of barren Tertiary strata which are known to occur interlayered with mineralized intrusive rock in the western part of the deposit may have been emplaced by a process involving one or more landslides near the developing graben border. A set of branching normal faults along this border may have been active continuously or intermittently over a period of time and may have triggered the slides which were later cut by continued movement resulting in a gradual stepwise northward down-dropping of blocks and corresponding southward rotation, such as illustrated schematically on Figure 23.


1
S
PRE-KAMLOOPS LAND SURFACE
N
I
O
I
2
S
N
T
I
O
I
O
I
O = ORE ZONE
I = INTRUSIVE HOST ROCK
T = KAMLOOPS GROUP ROCKS
3
S
N
SLIDE
T
T
I
O
T
T
I
O
I
O
I
4
S
N
SLIDE
T
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T
O
SLIDE
SLIDE
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APPROXIMATE PRESENT LAND SURFACE
I
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D.D.H.

Figure 23. Diagrammatic cross-sections showing possible mode of emplacement of wedges of barren Tertiary rock in the western part of the Afton ore zone.

All such faulting must have occurred at a sufficiently late time when any redistribution of copper by downward moving solutions had stopped because even the thinnest wedges of Tertiary rocks that are found in the orebody are completely barren. Before the development of these post-mineral normal faults, a set of northerly trending and probably westerly dipping shear zones or breaks appears to have segmented the presently known orebody into at least three blocks and probably to have provided avenues for downward percolation of copper-bearing solutions. At the time of graben formation these cross-shears or breaks may have had further movement along them, probably also of the normal type, thus contributing to further depressing the western part of the orebody with respect to the eastern part. The net result of the fault pattern and movements described above was to considerably depress the block of ground occupied by the presently known Afton deposit with respect to ground to the east and south of it, and thus allowing the zone of enriched copper mineralization to be capped by Tertiary strata and to be preserved from total removal by erosion during the Pleistocene.

SUMMARY OF GEOLOGIC HISTORY: The geologic history of the Afton deposit begins with the emplacement probably during Late Triassic time of the earlier gabbroic and dioritic phases of the Iron Mask batholith along a northwesterly trending zone of weakness into a succession of Nicola Group volcanic and sedimentary rocks of virtually the same age. This batholithic mass, as it differentiated, evolved from a relatively deep epizonal to mesozonal level to a much shallower epizonal to subvolcanic level at which time the fine-grained porphyries and bodies of breccia of the Cherry Creek suite were emplaced along the northern edge of the batholith and the porphyries of the Sugarloaf suite (*Minister of Mines, B.C.,* Ann. Rept., 1967, pp. 137-147) along the south edge. The almost complete segregation of these two porphyry suites along separate contact zones of the batholith or along major fault zones is believed to be due to structural reasons.

As one of the last intrusive phases of the Cherry Creek porphyry suite a body of porphyry breccia was emplaced within porphyry at the site of the Afton deposit. Considerable faulting along planes trending east-west and dipping steeply to the south probably preceded and accompanied this stage and controlled the emplacement of the various bodies of porphyry and of the breccia. Either during this time or shortly after, hydrothermal alteration of the various types described affected several of the rock types. Development of secondary biotite appears to have been one of the first stages of alteration and was followed by widespread saussuritization that, especially in the east half of the deposit, culminated with the emplacement of many magnetite veins and the development of the shoots of massive epidote-chlorite alteration of unit 7. Copper mineralization in the form of chalcopyrite and bornite with very little pyrite was introduced at this time and impregnated a crudely tabular zone some 200 to 250 feet thick, trending east-west, dipping steeply to the south, and centred roughly on the main body of intrusive breccia. As the hydrothermal stage continued, a zone of pyritic quartz-sericite altered rock developed to the west and, probably, to the south of the orebody.

Sometime between Upper Triassic and Middle Eocene time, a set of cross-shears and fractures was imposed on the deposit. Uplift sometime before the Middle Eocene caused the deposit to be unroofed and subsequently oxidized and secondarily enriched to a considerable depth. Abundant hematite, native copper, chalcocite, cuprite, and several other secondary copper minerals were produced at this time. Secondary enrichment continued until downward percolation of solutions was stopped either by changes in climate or by covering of the deposit by the first veneer of Tertiary strata.

In Early Tertiary time a graben became established immediately north of the orebody and, as it developed, became filled by a thick succession of volcanic and sedimentary strata. Normal faulting along the southern edge of this graben depressed the ground occupied by the Afton deposit in a series of northward lowering steps and caused an apparent widening of the ore zone in its western half, and by triggering slides caused the imbrication of wedges of barren Tertiary strata within the ore. Normal movement along pre-existing cross-shears or breaks may have also occurred at this time. As volcanism and sedimentation continued, the deposit was eventually covered by a layer of Tertiary strata of sufficient thickness to protect it from most of the erosion during the Pleistocene, so that when ice covered the area, only the protective Tertiary cover, the leached capping, and only a part of the enriched zone of the orebody were removed.

WORK DONE: Claims and topography mapped; induced polarization survey, 7 line-miles covering Dominion, Pot 4 Fraction, Afton Fraction, Afton 1, 2, 5-7, and Add 1-4, 15, 16; surface diamond drilling, 3 holes totalling 1,794 feet on Dominion, Pot 2 Fraction and Pot 4 Fraction and 25 holes totalling 21,563 feet on Pot 3, 4, and 10 Fractions, Afton 7, and Add 3; rotary drilling, 26 holes totalling 19,065 feet on the same claims; percussion drilling, 93 holes totalling 27,900 feet on the same claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 297; Carr, J. M. (1962), Geology of the Princeton, Merritt, Kamloops Area of Southern B.C., *Western Miner and Oil Review*, February, 1962, Vol. 35, No. 2, pp. 46-49; Millar, C. F. (1973), The Afton Discovery, *Western Miner*, February, 1973, Vol. 46, No. 2, pp. 33-36; *Minister of Mines, B.C.*, Ann. Rept., 1967, pp. 137-147; Parker, R. L. and Calkins, J. A. (1964), Geology of the Curlew Quadrangle, Ferry County, Washington, *U.S. Geol. Surv.*, Bull. 1169; Sutherland Brown, A. (1969), Mineralization in British Columbia and the Copper and Molybdenum Deposits, C.I.M., Trans., Vol. LXXII, pp. 1-15; Sutherland Brown, A., Cathro, R. J., Panteleyev, A., and Ney, C. S. (1971), Metallogeny of the Canadian Cordillera, C.I.M., Vol. LXXIV, pp. 121-145.

GUS (No. 257, Fig. B)

LOCATION: Lat. 50° 43.45' Long. 120° 40.47' (92I/10)
KAMLOOPS M.D. Mainly south of the Trans-Canada Highway, between Durand and Duffy Creeks, and centred 18 miles west of Kamloops.

CLAIMS: GUS 1 to 64.

ACCESS: By the Trans-Canada Highway which transects the northern part of the property.

OPERATOR: LAURA MINES LTD., 1700, 777 Hornby Street, Vancouver 1.

WORK DONE: Geochemical survey, 47 line-miles and magnetometer survey, 9 line-miles over the eastern section of the claim group.

REFERENCE: Assessment Report 4162.

KL (No. 101, Fig. B)

LOCATION: Lat. 50° 46.0' Long. 120° 35.0' (92I/10E, 15E)
KAMLOOPS M.D. At 2,000 feet elevation 1 mile north of Kamloops Lake and 4 miles northwest of Tranquille.

CLAIMS: SKI 1 to 10, 13 to 42.

ACCESS: By secondary road, 4 miles from Tranquille.

OPERATOR: SPECTROAIR EXPLORATIONS LIMITED, 850, 885 Dunsmuir Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Pyrite and chalcopyrite are disseminated in monzonite breccia near the contact with Nicola Group andesites.

WORK DONE: Induced polarization survey, approximately 10 line-miles.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 238 (KL); Assessment Reports 2001A, 2001B, 4021, 4022.

TROJAN (No. 105, Fig. B)

LOCATION: Lat. 50° 32.5' Long. 120° 59.5' (92I/10W)
KAMLOOPS M.D. At approximately 4,500 feet elevation on the south slope of Bose Hill.

CLAIMS: Twenty-four Crown grants (BILL, AJ) and 30 located claims including VENUS, SB, CN, MARS, LIL, MAX, and TOM.

ACCESS: By the Krain camp road from the Bethlehem mine road, 3 miles.

OWNER: South Seas Mining Limited.

OPERATOR: LEEMAC MINES LTD., 210, 890 West Pender Street, Vancouver 1.

METAL: Copper.

WORK DONE: Fifty percussion-drill holes totalling 5,605 feet were drilled on a high-grade breccia section near the shaft for the purpose of designing a small open pit. Holes were drilled on a 25-foot grid.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 353; Assessment Report 2788.

LUX, FORGE, SNOW (No. 113, Fig. B)

LOCATION: Lat. 50° 33.5'-35.5' Long. 120° 57-58' (92I/10W)
KAMLOOPS M.D. At approximately 6,000 feet elevation straddling Forge Creek, about 1.5 miles east of Forge Mountain.

CLAIMS: Thirty-four LUX, 14 FORGE and SNOW.

ACCESS: By the Krain camp road from the Bethlehem mine road, 5 miles.

OPERATORS: QUINTANA MINERALS CORPORATION, 1215, Two Bentall Centre, Vancouver 1 and GETTY MINING PACIFIC, LIMITED, 1904, 1177 West Hastings Street, Vancouver 1.

DESCRIPTION: Volcanic and pyroclastic rocks of the Kamloops Group unconformably overlie Guichon quartz diorite which is cut by porphyry dykes.

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 400 feet and 1 inch equals 1,320 feet covering Lux claims and 1 inch equals 1,320 feet covering Snow and Forge claims; induced polarization survey, 4 line-miles covering Lux claims; geochemical survey covering Lux claims; geochemical survey, 25 samples covering Snow and Forge claims; road construction, 1.6 miles; surface diamond drilling, one hole totalling 450 feet on Lux 7; percussion drilling, two holes totalling 700 feet on Lux and one hole totalling 430 feet on Snow.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 255.

GB, ELLA (No. 183, Fig. B)

LOCATION: Lat. 50° 34.1′ Long. 120° 53.3′ (92I/10W)
KAMLOOPS M.D. On Forge Creek, 3 miles south-southwest of Tunkwa Lake adjoining Big Meadow Lake on the north.

CLAIMS: GB 1 to 20, ELLA 94 and 95 Fractions.

ACCESS: By road from Savona, 15 miles.

OPERATOR: HIGHLAND VALLEY MINES LTD., 3rd Floor, 540 Howe Street, Vancouver 1.

DESCRIPTION: The eastern border rocks of the Guichon Creek batholith underlie the property. A zone of rocks transitional between Guichon granodiorite and Hybrid quartz diorite runs north-northwest through Big Meadow Lake.

WORK DONE: Surface diamond drilling, one hole totalling 874 on Ella 94 Fraction.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 252 (Ella); Assessment Report 784 (WDR).

POD (No. 34, Fig. B)

LOCATION: Lat. 50° 35.1′ Long. 120° 55′ (92I/10W)
KAMLOOPS M.D. Four miles southwest of Tunkwa Lake, 18 miles south of Savona.

CLAIMS: POD, totalling 28.

ACCESS: By all-weather gravel road from Savona and logging roads.

OPERATOR: RUSTY MAC MINES LTD., 1710, 1177 West Hastings Street, Vancouver 1.

METALS: Copper, silver.

DESCRIPTION: Tetrahedrite occurs in thin quartz veinlets in a prospect pit on Pod 2. The claims are underlain by quartz diorite of the Guichon variety of the Guichon Creek batholith. They straddle the transitional contact zone separating the Guichon variety from the Hybrid border phase of the batholith.

WORK DONE: Surface geological mapping, 1 inch equals 800 feet, line-cutting, and induced polarization surveys were done in late July and early August 1971.

REFERENCES: Assessment Reports 3631, 3632.

MAC, RR (No. 33, Fig. B)

LOCATION: Lat. 50° 36.5'-37' Long. 120° 49.2'-51.5' (92I/10W)
KAMLOOPS M.D. Between 2,500 and 3,200 feet elevation on Tunkwa Lake, 12 miles south of Savona.

CLAIMS: MAC 1 to 10, RR 1 to 33, BEN 1 to 8.

ACCESS: By all-weather gravel road from Savona.

OPERATOR: NEW GOLD STAR MINES LTD., 11, 4644 Lazelle Avenue, Terrace.

WORK DONE: Reconnaissance geochemical survey was carried out on two lines extending east from Tunkwa Lake. Samples were taken at 100-foot intervals on the Mac 1 to 8 claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 332 (Cat, Mac); Assessment Report 3823.

BERU (No. 182, Fig. B)

LOCATION: Lat. 50° 42' Long. 120° 47' (92I/10W)
KAMLOOPS M.D. At 3,000 to 4,000 feet elevation on the west side of Durand Creek, 1.5 miles east of Mount Savona.

CLAIMS: BERU 1 to 20.

ACCESS: The property lies astride the Savona-Mamit Lake road (Highway 5) between 5 and 8 miles south of Highway 1.

OWNER: CHALLENGER EXPLORATION LTD., 101, 325 Howe Street, Vancouver 1.

DESCRIPTION: According to Geological Survey of Canada Map 886A the unconformity between Tertiary lavas which cap Mount Savona and Triassic volcanic and sedimentary rocks of the Nicola Group crosses the property. Data in Assessment Report 4037, however, suggest that this unconformity is actually west of the claim block because the western claims, Beru 15 to 20, are said to be underlain by metamorphosed volcanic and sedimentary rocks. Sulphide mineralization is reported on Beru 15.

WORK DONE: An electromagnetic survey was conducted. Readings were taken 500 feet apart with lines 800 feet apart. Soil samples taken at each station were analysed for copper and molybdenum.

REFERENCE: Assessment Report 4037.

GO, DO, LE (No. 116, Fig. B) By W. J. McMillan

LOCATION: Lat. 50° 32.5'-36' Long. 121° 00'-03.5' (92I/10W, 11E)
KAMLOOPS M.D. One mile west of the peak of south Forge Mountain.

CLAIMS: GO, LE, HUB, CREEP, GOB, SQUARE, totalling 101.

ACCESS: By 7 miles of gravel road through the South Seas and Krain camps from the Bethlehem mine road.

OPERATORS: QUINTANA MINERALS CORPORATION, 1215, Two Bentall Centre, Vancouver 1 and GETTY MINING PACIFIC, LIMITED, 1904, 1177 West Hastings Street, Vancouver 1.

(92I/10W, 11E)

DESCRIPTION:

The southwestern half of the property is underlain by granodiorite of the Bethlehem phase of the Guichon Creek batholith. Over the northeastern half of the claims the granodiorite is intruded and unconformably overlain by volcanic and sedimentary rocks of the Eocene Kamloops Group. The Tertiary rocks have a basal sedimentary member overlain by andesitic lava flows with uncommon tuff, volcanic breccia, and agglomerate layers. At the northeast corner of the claim group a small plug of Tertiary quartz plagioclase porphyry is exposed. Post-Tertiary north and northeast-trending faults offset the volcanic rocks. Locally, what appear to be fanglomerate deposits composed mainly of Tertiary volcanic debris occur along the north-trending fault which separates the area overlain by young volcanic rocks from the area underlain by older granitic rocks.

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 1,320 feet; geochemical survey, 50 samples; road construction, 2 miles on Go 2, 3, and 4; surface diamond drilling, one hole totalling 1,508 feet on Go 3; percussion drilling, two holes totalling 750 feet on Le and Hub.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 253; Assessment Report 3895.

KRAIN (No. 114, Fig. B)

LOCATION: Lat. 50° 34.3′ Long. 120° 59.8′ (92I/10W, 11E)
KAMLOOPS M.D. At approximately 5,500 feet elevation on the east flank of Forge Mountain, 1 mile northwest of Bose Hill.

CLAIMS: KRAIN, KRAIN COPPER, DW, totalling 27.

ACCESS: By the Krain camp road from the Bethlehem mine road, 6 miles.

OWNER: North Pacific Mines Ltd.

OPERATORS: QUINTANA MINERALS CORPORATION, 1215, Two Bentall Centre, Vancouver 1 and GETTY MINING PACIFIC, LIMITED, 1904, 1177 West Hastings Street, Vancouver 1.

METAL: Copper.

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 400 and 1 inch equals 1,320 feet covering all claims; induced polarization survey, 5 line-miles covering Krain claims; geochemical survey, 100 samples covering Krain claims; road construction, 1.5 miles; surface diamond drilling, two holes totalling 2,500 feet on Krain 5 and DW 1; percussion drilling, seven holes totalling 2,000 feet on Krain claims.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 359.

SPEC (No. 185, Fig. B)

LOCATION: Lat. 50° 36′-39′ Long. 120° 56′ - (92I/10W, 11E)
KAMLOOPS M.D. At 4,500 feet elevation approximately 5 miles north of Forge Mountain.

CLAIMS: SPEC, totalling 209.

ACCESS: From the Bethlehem mine road by road through Krain camp, 10 miles.

(92I/10W, 15W)

OPERATORS: QUINTANA MINERALS CORPORATION, 1215, Two Bentall Centre, Vancouver 1 and GETTY MINING PACIFIC, LIMITED, 1904, 1177 West Hastings Street, Vancouver 1.

DESCRIPTION: The claims are underlain by volcanic and pyroclastic rocks of the Kamloops Group which unconformably overlie granitic rocks of the Guichon Creek batholith.

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 1,320 feet; geochemical survey, 100 samples; road construction, one-half mile; percussion drilling, three holes totalling 900 feet on Spec 181 and 184.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 261 (MM).

LUCKY STRIKE (No. 35, Fig. B)

LOCATION: Lat. 50° 45' Long. 120° 58.5' (92I/10W, 15W)
KAMLOOPS M.D. At approximately 1,000 feet elevation immediately south of Walhachin, 16 miles east of Cache Creek.

CLAIMS: LUCKY STRIKE, SAM, RR, S, FRANKIE, totalling 152.

ACCESS: By four-wheel-drive vehicle road from Walhachin, one-half to 1 mile.

OPERATOR: HART RIVER MINES LTD., 848 West Hastings Street, Vancouver 1.

METALS: Copper, zinc.

DESCRIPTION: The showings occur in and around a ballast quarry immediately south of the Canadian Pacific Railway tracks at Walhachin. Mineralization occurs in silicified skarny zones in Nicola Group volcanic and sedimentary rocks. Chalcopyrite and bornite with magnetite and sphalerite stringers and blebs have been reported.

WORK DONE: Geochemical soil survey, 239 samples collected along east-west lines around and south of the Canadian Pacific Railway quarry.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 358, 359; Assessment Report 3751.

DEN (No. 40, Fig. B)

LOCATION: Lat. 50° 32' Long. 121° 03' (92I/11E)
KAMLOOPS M.D. On the southwest slope of south Forge Mountain, east of Twentyfour Mile Lake, 10.5 miles southeast of Ashcroft.

CLAIMS: DEN, NED, FC, ELKE, LEM, DN, totalling 43 claims and 16 fractions.

ACCESS: By road from Ashcroft, 25 miles.

OWNER: Adera Mining Limited.

OPERATOR: GRANDORA EXPLORATIONS LTD., 511, 850 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Malachite-stained bornite occurs occasionally in fine fractures. The property is underlain primarily by rocks of the Bethlehem phase of the Guichon Creek batholith but is covered by Tertiary flows at its northeast edge.

WORK DONE: Line-cutting; geological mapping, 1 inch equals 500 feet.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 251; Assessment Report 3660.

CHRIS, VAL **(No. 116, Fig. B)**

LOCATION: Lat. 50° 35.5'-39' Long. 121° 01.5'-05' (92I/11E)
KAMLOOPS M.D. At approximately 5,400 feet elevation 5 miles north-northwest of Forge Mountain.

CLAIMS: CHRIS, VAL, totalling 225.

ACCESS: By the Krain camp road from the Bethlehem mine road, 10 miles.

OWNER: Quintana Minerals Corporation.

OPERATORS: QUINTANA MINERALS CORPORATION, 1215, Two Bentall Centre, Vancouver 1 and GETTY MINING PACIFIC, LIMITED, 1904, 1177 West Hastings Street, Vancouver 1.

DESCRIPTION: Volcanic and pyroclastic rocks of the Tertiary Kamloops Group underlie this claim block.

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 1,320 feet; road construction, one-half mile.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 261 (MM); Assessment Reports 2078, 3895 (in part).

HY (GIBBEX) **(No. 228, Fig. B)**

LOCATION: Lat. 50° 39' Long. 121° 10' (92I/11E)
KAMLOOPS M.D. On the northwest slope of Glossy Mountain, 10 miles southeast of Ashcroft.

CLAIMS: HY 1 to 21.

ACCESS: By the Highland Valley Highway from Ashcroft, 8.5 miles to a secondary road which leads eastward to the property.

OWNER: Gibbex Mines Ltd.

OPERATOR: T.V.S. INDUSTRIES LTD., 80 West Seventh Avenue, Vancouver 10.

DESCRIPTION: The western part of the property straddles the contact between the Hybrid phase of the Guichon Creek batholith and metamorphosed volcanic and sedimentary rocks of the Triassic Nicola Group. Along the east side of the property rocks of the Nicola Group are unconformably overlain by Tertiary volcanic rocks.

WORK DONE: Geological survey.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 340; Assessment Report 4067.

HY (EAGLE BAY) **(No. 37, Fig. B)**

LOCATION: Lat. 50° 40.5' Long. 121° 10' (92I/11E)
KAMLOOPS M.D. At the head of Studhorse Creek, 8 miles southeast of Ashcroft.

CLAIMS: HY 22 to 49.

ACCESS: By road from Ashcroft via the Highland Valley Highway and the Barnes Lake road.

OWNER: EAGLE BAY MINES LTD., 570, 885 Dunsmuir Street, Vancouver 1.

(92I/11E, 14E)

WORK DONE: A magnetometer survey was done over HY 35-46 on the northern part of the group and over HY 23-28 on the southern part. Readings were taken at 100-foot intervals along east-west lines 400 feet apart.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 340; Assessment Report 3451.

KEV (No. 117, Fig. B)

LOCATION: Lat. 50° 44'-46' Long. 121° 04'-10' (92I/11E, 14E)
KAMLOOPS M.D. Between 2,500 and 3,000 feet elevation surrounding Separating Lake, 7 miles east-northeast of Ashcroft.

CLAIMS: KEV 1 to 106.

ACCESS: By highway and the Barnes Lake road from Ashcroft, 12 miles.

OWNER: MUNDEE MINES LTD., 300, 540 Burrard Street, Vancouver 1.

DESCRIPTION: The claims are mainly underlain by Kamloops Group volcanic rocks which cap intrusive rocks of the Guichon Creek batholith. The Guichon intrusive rocks are in contact with the older Nicola Group rocks in the northeast section of the claim group, although the contact is hidden by younger volcanic rocks.

WORK DONE: Trenching on Kev 11, 13, 15, 27, 29, 31, and 54; stripping on Kev 52, 78, and 79.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 360; Assessment Report 3081.

CHIEF, GEO (No. 36, Fig. B)

LOCATION: Lat. 50° 44.5' Long. 121° 02' (92I/11E, 14E)
KAMLOOPS M.D. At approximately 3,000 feet elevation straddling Brassy Creek, 2 miles east-northeast of Pennie Lake.

CLAIMS: CHIEF 1 to 48, CHIEF A1, A2, GEO 57 to 62, HASSO 3, 5 to 10, 15 to 21.

ACCESS: By road from Walhachin, 2 miles.

OWNER: Supertest Investments and Petroleum Limited.

OPERATOR: BPOG OPERATIONS LTD., 335 Eighth Avenue SW., Calgary, Alta.

METALS: Silver, copper, iron.

DESCRIPTION: Nicola Group volcanic rocks with limestone layers are intruded by a quartz diorite plug which is apparently an offshoot of the Guichon Creek batholith. These rocks are unconformably overlain by Jurassic conglomerates which are in turn unconformably overlain by Tertiary lavas of the Kamloops Group.

WORK DONE: Magnetometer survey, 55 line-miles covering covering all claims; geochemical soil survey, 500 samples covering Chief 13-20,25-33, 45 and Geo 61, 62.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, pp. 359, 360; Assessment Report 3743 (line-cutting).

MARS (No. 39, Fig. B)

LOCATION: Lat. 50° 33.5' Long. 121° 18.4' (92I/11W)
KAMLOOPS M.D. On the west bank of the Thompson River, one-half mile south of Epsom on Highway 1 and 10 miles north of Spences Bridge.
CLAIMS: MARS 1 to 8.
ACCESS: By Highway 1 from Spences Bridge.
OWNER: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.
DESCRIPTION: The claims underlain by altered tuffs and andesites of the Cache Creek Group.
WORK DONE: Geological mapping, 1 inch equals 200 feet and geochemical soil survey, 722 samples during 1971 and 1972.
REFERENCE: Assessment Report 3680.

SHAWN (No. 38, Fig. B)

LOCATION: Lat. 50° 34.5' Long. 121° 18.4' (92I/11W)
KAMLOOPS M.D. West of the Thompson River, 17 miles south of Cache Creek.
CLAIMS: SHAWN 1 to 3.
ACCESS: By Highway 97 from Cache Creek.
OWNER: R. SUTTON, Box 1357, Quesnel.
WORK DONE: Geochemical survey, 54 samples.
REFERENCE: Assessment Report 3697.

A, B, C (No. 229, Fig. B)

LOCATION: Lat. 50° 30'-32' Long. 121° 39'-41' (92I/12E)
KAMLOOPS M.D. At approximately 4,500 feet elevation on the east side of McGillivray Creek, 20 miles north of Lytton.
CLAIMS: A 1 to 16, B 1 to 16, C 1 to 6, JOE 1 to 4.
ACCESS: By Highway 12 and dirt road from Lytton, 1.75 miles from highway.
OWNER: ACACIA MINERAL DEVELOPMENT CORPORATION LTD., 201, 535 Howe Street, Vancouver 1.
DESCRIPTION: The property is probably underlain by granitic rocks of the Mount Lytton batholith near fault contacts with the Cretaceous Lillooet Group to the west and Spences Bridge Group to the east.
WORK DONE: Trenching and stripping; road construction, 5 miles.

R (No. 186, Fig. B)

LOCATION: Lat. 50° 51' Long. 121° 32' (92I/13E)
KAMLOOPS M.D. On Hat Creek, between Indian Reserves 1 and 2, 10 miles west-northwest of Cache Creek.
CLAIMS: R 41 to 62.

(92I/13E, 14W)

ACCESS: By Highway 12 from Cache Creek, 12 miles.

OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

DESCRIPTION: The claims are underlain by the Tertiary Coldwater beds. Outcrops are numerous.

WORK DONE: Percussion drilling, four holes totalling 650 feet on R 51, 53, 57, and 61.

PAW, SAM, RANGER (No. 4, Fig. B)

LOCATION: Lat. 50° 58' - 51' 00' Long. 121° 27.6'-32' (92I/13E, 14W; 92P/3W, 4E)
KAMLOOPS and CLINTON M.D. On Highway 97 near Maiden Creek, 15 miles north of Cache Creek.

CLAIMS: PAW, SAM, RANGER, GW, totalling approximately 80.

ACCESS: By Highway 97 from Cache Creek, 15 miles.

OPERATOR: PEYTO OILS LTD., 353 Examiner Bldg., Calgary, Alta.

WORK DONE: Magnetometer and geochemical surveys during 1971; induced polarization survey during 1972.

REFERENCES: Assessment Reports 3681, 4026.

NANCI (No. 2, Fig. B)

LOCATION: Lat. 50° 58.2'-59' Long. 121° 44.5'-47' (92I/13)
CLINTON and LILLOOET M.D. On Hambrook Creek 2 to 2.5 miles west of Pavilion Mountain, approximately 25 miles north-northeast of Lillooet.

CLAIMS: NANCI 1 to 14, 27, 28, 41, 42, 57 to 62.

ACCESS: By road from Lillooet, approximately 25 miles.

OWNER: LONE CREEK MINES LTD., 312 Masters Avenue, Victoria.

WORK DONE: Electromagnetic survey.

REFERENCE: Assessment Report 3826.

SALLUS (No. 3, Fig. B)

LOCATION: Lat. 50° 46.0' Long. 121° 47' (92I/13W)
LILLOOET M.D. At elevations of 1,400 to 6,500 feet between Gibbs and Sallus Creeks, 10 miles northeast of Lillooet.

CLAIMS: SALLUS 1 to 24, 60 to 91, 119 to 124, SALLUS CREEK 25 to 38, 41 to 52, 101 to 118.

ACCESS: By Highway 12 and logging road from Lillooet.

OWNER: CANADIAN JOHNS-MANVILLE COMPANY LIMITED, Box 1500, Asbestos, P.Q.

WORK DONE: Induced polarization survey covering Sallus 68-71 and 87-89 during 1971.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 228; Assessment Reports 3095, 3574.

BERT, BELL (No. 8, Fig. B)

LOCATION: Lat. 50° 46.5'-48.7' Long. 121° 9.5'-13.5' (92I/14E)
KAMLOOPS M.D. At elevations of 1,700 to 2,000 feet on Highway 1, 6 miles southeast of Cache Creek.
CLAIMS: BERT 1 to 20, BELL 1 to 37.
ACCESS: By Highway 1 from Cache Creek.
OPERATOR: BON-VAL MINES LTD. (formerly Bonnet Mines Ltd.), 515, 602 West Hastings Street, Vancouver 2.
WORK DONE: Magnetometer and electromagnetic surveys covering Bert 1-10, 12, 14, 16, 18, 20.
REFERENCE: Assessment Report 3572.

P&L (No. 9, Fig. B)

LOCATION: Lat. 50° 47.2' Long. 121° 01' (92I/14E)
KAMLOOPS M.D. One mile northwest of Walachin, north of the irrigation ditch, 35 miles west of Kamloops.
CLAIMS: P&L 1 to 10.
ACCESS: By Trans-Canada Highway from Kamloops.
OWNER: L. Ovington.
OPERATOR: COLT MANAGEMENT LTD., 303, 481 Greenstone Drive, Kamloops.
WORK DONE: Induced polarization survey covering P&L 5-8.
REFERENCE: Assessment Report 3691.

MIDAS, BIRD (No. 6, Fig. B)

LOCATION: Lat. 50° 46'-49.5' Long. 121° 18.5'-22.5' (92I/14W)
KAMLOOPS M.D. At elevations of 1,500 to 4,300 feet on Highway 1, 1.5 miles south of Cache Creek.
CLAIMS: MIDAS 1 to 29, 37 to 46, BIRD 1 to 82, NBC 1 to 8.
ACCESS: By Highway 1 from Cache Creek.
OWNER: ACROLL OIL & GAS LTD., 574 Calgary Place One, Calgary, Alta.
WORK DONE: Magnetometer and electromagnetic surveys covering southern portion of Bird and Midas claims.
REFERENCE: Assessment Report 3587.

COLT, BOB (No. 7, Fig. B)

LOCATION: Lat. 50° 47.8'-50.8' Long. 121° 15.6'-20' (92I/14W)
KAMLOOPS M.D. At elevations of 1,600 to 2,800 feet on Highway 1, 1.5 miles east of Cache Creek.
CLAIMS: COLT 1 to 22, BOB 1 to 16, SOB 1 to 17, 38 to 45.
ACCESS: By Highway 1.
OWNER: ACROLL OIL & GAS LTD., 574 Calgary Place One, Calgary, Alta.
WORK DONE: Magnetometer survey covering the southern section of the claims.
REFERENCE: Assessment Report 3573.

HAM, EGGS (No. 189, Fig. B)

LOCATION: Lat. 50° 49.7′-52.3′ Long. 121° 24′-26′ (92I/14W)
KAMLOOPS M.D. The property is centred 1.5 miles west of Highway 97 and 5 miles northwest of Cache Creek.

CLAIMS: HAM 1 to 19, EGGS 1 to 30, STEW 1 to 12.

ACCESS: North from Cache Creek by Highway 97, 6 miles to Carquile road, thence 2 miles west.

OPERATOR: MILESTONE MINES LIMITED, 574 Calgary Place One, Calgary, Alta.

DESCRIPTION: The claims are underlain by Paleozoic rocks of the Cache Creek Group.

WORK DONE: Geochemical survey, 8.5 line-miles; grid lines southwest-northeast and 500 feet apart; 24 line-miles of grid cut.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 303; Assessment Report 4068.

T (No. 187, Fig. B)

LOCATION: Lat. 50° 51′ Long. 121° 23′ (92I/14W)
KAMLOOPS M.D. At approximately 1,600 feet elevation on Bonaparte Creek, immediately north of Indian Reserve 3A, 4 miles northwest of Cache Creek.

CLAIMS: T 1 to 20.

ACCESS: By Highway 97 from Cache Creek, 4 miles.

OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

DESCRIPTION: No outcrops occur on the claims. Percussion drilling and adjacent geology indicate the claims are underlain by rocks of the Cache Creek Group.

WORK DONE: Percussion drilling, three holes totalling 540 feet on T 2, 3, and 5.

MA, KID (No. 5, Fig. B)

LOCATION: Lat. 50° 51.5′-53.5′ Long. 121° 23′-25.5′ (92I/14W)
KAMLOOPS M.D. On the west side of Highway 97, at the intersection of Highway 12, 7 miles north of Cache Creek.

CLAIMS: MA, KID, MAY, FUZZY, MAP, totalling 60.

ACCESS: By Highways 97 and 12.

OWNERS: Northair Mines Ltd. and Select Resources Ltd.

OPERATOR: NORTHAIR MINES LTD., 333, 885 Dunsmuir Street, Vancouver 1.

DESCRIPTION: The claims are underlain by the Upper Paleozoic volcanic and metasedimentary rocks of the Cache Creek Group which to the east are unconformably overlain by Middle Eocene volcanic rocks of the Kamloops Group. Reconnaissance mapping indicates that the Cache Creek assemblage consists of foliated andesite, green phyllite, and sheared argillite, all displaying a north-northwesterly trending foliation.

WORK DONE: Magnetometer survey, 15 line-miles covering Ma 9-12, 14, 16, 18, 20, 25, 27, 29, Ma 41 and 42 Fractions, Kid 1 and 2, Fuzzy 2, 3, 6, and Map 1 Fraction.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 302; Assessment Report 3667.

MAGGIE MINE (No. 227, Fig. B)

E. Sadar

LOCATION: Lat. 50° 55.4' Long. 121° 25.7' (92I/14W)
KAMLOOPS M.D. At approximately 1,700 feet elevation immediately west of Highway 97 in the valley of Bonaparte River, 9 miles north of Cache Creek.

CLAIMS: The company holds Mineral Lease M-33, comprising 12 lots, and 211 recorded mineral claims and fractions.

ACCESS: By Highway 97 north from Cache Creek, 9 miles.

OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION:

The Maggie deposit occurs in and adjacent to an Early Tertiary biotite-quartz diorite porphyry which intrudes argillites, chert tuffs, and andesitic volcanic flows of the Pennsylvanian (?) to Permian Cache Creek Group. The entire sequence is overlain to the east and northeast by Tertiary volcanic cover. Both porphyry and country rock were pervasively veined with quartz and altered to sericite, kaolinite, and biotite. Pyrite, chalcopyrite, molybdenite, and possibly bornite and tetrahedrite occur in quartz veins and as disseminated grains. Maximum development of pyrite, chalcopyrite, and molybdenite occurs in successive zones from periphery to core.

WORK DONE: Two exploratory holes totalling 1,108 and 1,600 feet were drilled to test the southeastern extension of the orebody. Some additional geological mapping was completed within localized portions of the claim block.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, pp. 324, 325; 1971, p. 304.

BOOTS, SADDLE (No. 145, Fig. B)

LOCATION: Lat. 50° 55.5' Long. 121° 22' (92I/14W)
KAMLOOPS M.D. On the east side of Highway 97, 8 miles north of Cache Creek.

CLAIMS: BOOTS 1 to 12, SADDLE 9 to 14, BE-BE 9 to 28.

ACCESS: By Highway 97 from Cache Creek, thence by 1 to 2 miles of all-weather gravel road to the property.

OWNER: Acroll Oil & Gas Ltd.

OPERATOR: LEEMAC MINES LTD., 630, 890 West Pender Street, Vancouver 1.

DESCRIPTION: The claims are underlain by greenstone, chert, and argillite of the Permian Cache Creek Group which locally is unconformably overlain by volcanic rocks of the Tertiary Kamloops Group. Exposure is poor but minor amounts of malachite, azurite, chalcopyrite, and pyrite are reported in outcrop.

WORK DONE: Geochemical soil survey, 20 line-miles covering all claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 302; Assessment Report 3942.

AGATE (No. 146, Fig. B)

LOCATION: Lat. 50° 56′ Long. 121° 24′ (92I/14W)
KAMLOOPS M.D. Immediately south of Scottie Creek and east of Highway 97, approximately 10 miles north of Cache Creek.

CLAIMS: AGATE 1 to 15, AGA 1 Fraction.

ACCESS: By Highway 97 from Cache Creek, 12 miles.

OWNER: PAN OCEAN OIL LTD., 1050 Three Calgary Place, 355 Fourth Avenue SW., Calgary, Alta.

METALS: Copper, molybdenum.

DESCRIPTION: The property is underlain by Cache Creek cherts and argillites which have been intruded by an ultrabasic body.

WORK DONE: Magnetometer survey, 7.1 line-miles and geochemical survey, 185 samples covering all claims.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 325.

BOND, BB (No. 190, Fig. B)

LOCATION: Lat. 50° 57.5′ Long. 121° 27′ (92I/14W)
KAMLOOPS M.D. Straddling Highway 97, 11 miles north of Cache Creek; adjoins the Maggie deposit on the north.

CLAIMS: BOND 1 to 23, BB 1 to 8.

ACCESS: By Highway 97 from Cache Creek, 11 miles.

OWNER: INTERNATIONAL MARINER RESOURCES LTD., 4701 Bank Tower, Toronto-Dominion Centre, Toronto, Ont.

DESCRIPTION: Drilling apparently encountered dioritic rocks underlying Bonaparte River valley. The diorites do not outcrop.

WORK DONE: Percussion drilling, five holes totalling 1,180 feet on Bond 1, 3, 4, and 23.

S (No. 188, Fig. B)

LOCATION: Lat. 50° 58′ Long. 121° 28′ (92I/14W)
KAMLOOPS M.D. At the junction of Loon Lake road and Highway 97, 12.5 miles northwest of Cache Creek.

CLAIMS: S 1 to 39.

ACCESS: By Highway 97 from Cache Creek, 13 miles.

OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

DESCRIPTION: The claims are underlain by Cache Creek rocks. Outcrops are fairly plentiful.

WORK DONE: Percussion drilling, five holes totalling 1,120 feet on S 3, 7, 11, 18, and 23.

MAXINE (No. 30, Fig. B)

LOCATION: Lat. 50° 45.5' Long. 120° 39.4' (92I/15E)
KAMLOOPS M.D. On the north shore of Kamloops Lake, 1 mile west of Frederick, 15 miles northwest of Kamloops.

CLAIMS: GREENSTONE 1 to 10.

ACCESS: By road from Kamloops, 15 miles.

OPERATOR: CITEX MINES LTD., 210, 890 West Pender Street, Vancouver 1.

METALS: Copper, silver.

DESCRIPTION: Pyrite, chalcopyrite, and magnetite occur as sparse disseminations and chalcocite is found in narrow, widely separated shears in fragmental and massive volcanic rocks that may be part of the Nicola Group.

WORK DONE: Line-cutting.

REFERENCES: Minister of Mines, B.C., Ann. Rept., 1915, p. 216; 1918, p. 236; Assessment Reports 1751, 2363, 3696.

CAN (No. 191, Fig. B)

LOCATION: Lat. 50° 52' Long. 120° 31' (92I/15E)
KAMLOOPS M.D. Between Cannell and Watching Creeks, 16 miles north-northwest of Kamloops.

CLAIMS: CAN 1 to 66.

ACCESS: By road from Kamloops, 20 miles.

OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

DESCRIPTION: The property is underlain by Tertiary volcanic rocks.

WORK DONE: Surface geological mapping, 1 inch equals 50,000 feet covering all claims; percussion drilling, three holes totalling 900 feet on Can 2, 47, and 61.

ALLIES (No. 11, Fig. B)

LOCATION: Lat. 50° 52.4' Long. 120° 33.8' (92I/15E)
KAMLOOPS M.D. On Cannell Creek 1 mile southeast of Sydney Lake, approximately 20 miles northwest of Kamloops.

CLAIMS: DOG 103 to 112.

ACCESS: By secondary and logging roads from Kamloops.

OWNER: SOUTH OAK MINES LTD., 614, 602 West Hastings Street, Vancouver 2.

METAL: Gold.

DESCRIPTION: High-grade gold was reported to occur in grey porphyry float containing quartz veins and stringers which carried pyrite, chalcopyrite, galena, and sphalerite. Outcrops in the area reportedly contained only low-grade gold. The source of the high-grade gold was not found.

WORK DONE: Line-cutting.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1934, p. D26 (Allies); 1968, p. 172 (Bob); *Geol. Surv., Canada, Mem.* 249, pp. 73-75; Assessment Report 3674.

TENDERFOOT **(No. 10, Fig. B)**

LOCATION: Lat. 50° 48′ Long. 120° 45.5′ (92I/15W)
KAMLOOPS M.D. At elevations of 1,200 to 2,000 feet on the north shore of Kamloops Lake, 1 mile northeast of Copper Creek station.

CLAIMS: J 1 to 24.

ACCESS: By gravel and dirt road from Savona, 17 miles.

OWNER: FALAISE LAKE MINES LTD., 420 Howe Street, Vancouver 1.

METALS: Copper, silver.

DESCRIPTION: Bornite and chalcocite occur in quartz-calcite veins which cut augite porphyry basalt.

WORK DONE: Geochemical survey, 110 samples covering J 1-4, 21, and 23.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1962, p. 60; Assessment Report 3781.

ALFA, ALPHA **(No. 272, Fig. B)**

LOCATION: Lat. 50° 51′-53.5′ Long. 120° 48′-52′ (92I/15W)
KAMLOOPS M.D. At the headwaters of Carabine Creek, 8 miles north-northeast of Savona.

CLAIMS: ALFA 9 to 34, ALPHA 35 to 112.

ACCESS: By dirt road from Savona, 10 miles.

OWNER: KELVER MINES LTD., Box 10050 Pacific Centre, 700 West Georgia Street, Vancouver 5.

WORK DONE: Line-cutting, 21 line-miles; surface geological mapping; magnetometer and geochemical soil surveys.

CRISS CREEK (MAC MERCURY) **(No. 269, Fig. B)**

LOCATION: Lat. 50° 54.8′ Long. 120° 55.8′ (92I/15W)
KAMLOOPS M.D. On Criss Creek, 11 miles north-northwest of Savona.

CLAIMS: SPLIT 1 to 40.

ACCESS: By the Deadman Creek road from the Trans-Canada Highway, 11 miles.

OWNER: ANDEX MINES LTD., 305, 543 Granville Street, Vancouver 2.

METALS: Antimony, silver, copper, mercury.

WORK DONE: Surface geological mapping, 1 inch equals 800 feet; geochemical soil survey, 526 samples; surface diamond drilling, two holes totalling 160 feet on Split 35 and 36.

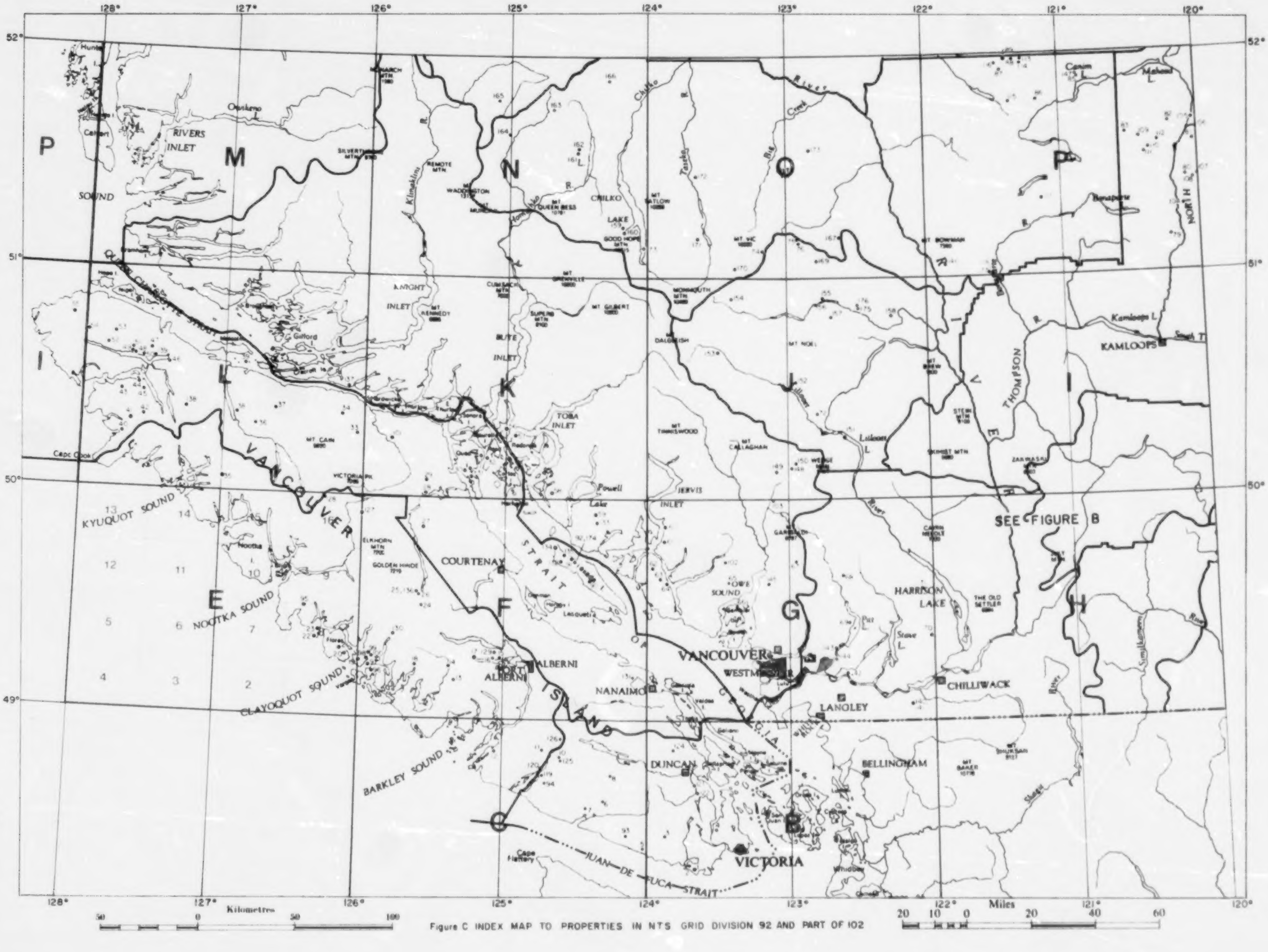
REFERENCES: *Minister of Mines, B.C.*, 1896, p. 568; 1900, p. 891; 1924, p. 149; 1929, p. 236; 1933, p. 182; *Geol. Surv., Canada*, Mem. 249, p. 96; Assessment Report 4305.

W (No. 192, Fig. 8)

LOCATION: *Lat. 50° 48.5′ Long. 120° 25′ (92I/16W)*
KAMLOOPS M.D. One and one-half miles northeast of Lac du Bois, approximately 10 miles north-northwest of Kamloops.
CLAIMS: *W 1 to 28.*
ACCESS: *By the gravelled Lac du Bois road which leaves the paved Tranquille road on the outskirts of North Kamloops.*
OWNER: BORU MINING LTD., 2070, 777 Hornby Street, Vancouver 1.
WORK DONE: Geochemical soil survey, 1,800 samples; surface diamond drilling, 2,000 feet.
REFERENCE: Assessment Report 4189.

DAIRY (No. 13, Fig. 8)

LOCATION: Lat. 50° 48.5′ Long. 120° 22′ (92I/16W)
KAMLOOPS M.D. At approximately 2,500 feet elevation between Dairy and McQueen Creeks, 3 miles west of the North Thompson River, 10 miles north of Kamloops.
CLAIMS: DAIRY 1 to 20.
ACCESS: By road from Kamloops, 10 miles.
OWNER: ANGLO-BOMARC MINES LTD., 301, 540 Burrard Street, Vancouver 1.
DESCRIPTION: The property is underlain by Cache Creek volcanic rocks intruded by granitic stocks.
WORK DONE: Geochemical soil and silt survey, 203 samples covering all claims.
REFERENCE: Assessment Report 3898.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MONARCH MTN
REMOTE MTN
MT WADDINGTON
MT QUEEN BESS
Klinaklini R
CHILKO LAKE
Chilko R
Taseko R
Big Creek
MT TATLOW
GOOD HOPE MTN
MT VIC
MT BOWMAN
Bonaparte
Canim L
Mahood L
NORTH THOMPSON
KNIGHT INLET
MT RENNEDY
BUTE INLET
MT GRENVILLE
MT GILBERT
MONMOUTH MTN
DALGLEISH
MT NOEL
Kamloops L
KAMLOOPS
South T
THOMPSON
Gilford
QUEEN CHARLOTTE STRAIT
Cape Cook
MT CAIN
VICTORIA PK
TOBA INLET
MT TINNISWOOD
MT CALLAGHAN
Lillooet L
Lillooet R
STEIN MTN
SKIHIST MTN
ZAKWASKI
VANCOUVER
KYUQUOT SOUND
Nootka I
ELKHORN MTN
GOLDEN HINDE
COURTENAY
Powell Lake
JERVIS INLET
GARIBALDI
HARRISON LAKE
THE OLD SETTLER
CAIRN NEEDLE
SEE FIGURE B
NOOTKA SOUND
STRAIT OF GEORGIA
HOWE SOUND
Stave L
Pitt L
Lasqueti
CLAYOQUOT SOUND
ALBERNI
PORT ALBERNI
NANAIMO
VANCOUVER
WESTMINSTER
CHILLIWACK
LANGLEY
Similkameen
ISLAND
BARKLEY SOUND
DUNCAN
BELLINGHAM
MT BAKER
MT SHUKSAN
Skagit
Cape Flattery
JUAN DE FUCA STRAIT
VICTORIA
Whidbey
13
14
12
11
10
5
6
7
4
3
2
Kilometres
50
0
50
100
Miles
20
10
0
20
40
60

Figure C INDEX MAP TO PROPERTIES IN NTS GRID DIVISION 92 AND PART OF 102

KEY TO PROPERTIES ON INDEX MAP, FIGURE C.

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20. ORMOND, CONTACT, page 262.
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22. K, page 261.
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34. ROONEY, page 292.
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36. HAB, page 290.
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58. OK, page 284.
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66. COPPER BAY, page 276.
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79. CP, page 315.
80. GOLD HILL, page 318.
81. PEST, page 318.
82. CP, page 319.
83. SO, page 321.
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86. STAN, FIR, page 324.
87. WD, page 322.
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114. TIM, page 325.

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122. COBBLE HILL QUARRY, page 599.
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125. JD, MARC, page 260.
126. SOUTHERN CROSS, page 261.
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133. TT, JT, Y, page 273.
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163. BU, page 309.
164. MO, page 310.
165. MOUNTAIN BOSS, page 310.
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SOUTHWEST BRITISH COLUMBIA
(NTS Division 92 and part of 102 Figure C)

VICTORIA 92B

BEAR CREEK (No. 3, Fig. C)

LOCATION: Lat. 48° 28.3'-30' Long. 123° 45'-88' (92B/5W)
VICTORIA M.D. The property lies between Sooke and Jordan Rivers and is centred 10 miles northwest of Sooke.
CLAIMS: Option on two permits of CanPac Minerals Limited, approximately 15,000 acres; the permits are in the E & N Railway land grant.
ACCESS: By logging road from the Sooke-Port Renfrew Highway, 11 miles.
OWNER: CanPac Minerals Limited.
OPERATOR: RIO ALTO EXPLORATION LTD., 920, 355 Fourth Avenue SW., Calgary, Alta.
DESCRIPTION: The area is underlain by Tertiary Metchosin volcanic rocks which have been intruded by gabbro, dacite, and quartz diorite.
WORK DONE: Induced polarization survey, 15 line-miles and geochemical soil survey, 275 samples on permits 71 and 82.

T, ZZ (No. 1, Fig. C)

LOCATION: Lat. 48° 20.5' Long. 123° 40' (92B/5E)
VICTORIA M.D. Central part of the Sooke Peninsula.
CLAIMS: BLAST 1, 2, ZZ 1 to 16, T 5 to 8.
ACCESS: By road from Sooke, 15 miles.
OWNER: CITEX MINES LTD., 210, 890 West Pender Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Chalcopyrite is disseminated in gabbro.
WORK DONE: Magnetometer survey, 12 line-miles.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 226; Assessment Report 3584.

SOOKE COPPER (No. 2, Fig. C)

LOCATION: Lat. 48° 20.5' Long. 123° 42.5' (92B/5E)
VICTORIA M.D. On Sooke Peninsula near Iron Mine Bay.
CLAIMS: EMDYK, JACK, W, K, totalling 23.
ACCESS: By road from the Victoria-Sooke Highway.
OWNER: MACSAN EXPLORATIONS LTD., 620 Howe Street, Vancouver 1.
WORK DONE: Airborne magnetometer survey during 1971.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 225; Assessment Report 3469.

KINKAM (No. 4, Fig. C)

LOCATION: Lat. 48° 31.2′ Long. 123° 31.6′ (92B/12E)
VICTORIA M.D. At an elevation of 1,210 feet on Jocelyn Hill, on the east side of Finlayson Arm, 20 miles north of Victoria.

CLAIMS: KINKAM 1 to 12; MERYL (Lot 90).

ACCESS: By Highway 1 and Millstream road from Victoria.

OWNERS: Armside Mining Ltd. and G. Kinneard.

OPERATOR: ARMSIDE MINING LTD., c/o Campney and Murphy, 1030 West Georgia Street, Vancouver 5.

METALS: Minor copper, molybdenum.

WORK DONE: Magnetometer and electromagnetic surveys during 1971; channel sampling and geological surveys during 1972.

REFERENCES: Assessment Reports 3675, 3952.

LENORA, TYEE (No. 124, Fig. C)

LOCATION: Lat. 48° 52′ Long. 123° 47′ (92B/13W)
VICTORIA M.D. Between 1,000 and 2,000 feet elevation on Mount Sicker, 7 miles northwest of Duncan.

CLAIMS: Thirty-eight Crown-granted claims (LENORA, Lot 35G; TYEE, Lot 36G; RICHARD III, Lot 39G) including three mineral leases, 47 located claims and fractions, plus two areas under lease or under option to lease in the Esquimalt and Nanaimo land belt.

ACCESS: By road from Duncan, 15 miles.

OWNER: Mount Sicker Mines Ltd.

OPERATOR: DUCANEX RESOURCES LIMITED, 1202, 1177 West Hastings Street, Vancouver 1.

METALS: Gold, silver, copper, zinc.

DESCRIPTION: Pyroclastic and sedimentary rocks of the Sicker Group have been regionally metamorphosed to chlorite and quartz sericite schist. Minor pyritic chert bands are also present. These rocks have been intruded by diorite and gabbro which appears conformable to schistosity. Low-grade disseminated sulphide occurrences are abundant. Massive copper-zinc sulphide bodies have been found only in the area of the old mine.

WORK DONE: Line-cutting; surface geological mapping, 1 inch equals 200 feet and electromagnetic survey, approximately 30 line-miles covering all claims and leased areas; surface diamond drilling, five holes totalling 3,000 feet.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 291; Assessment Reports 3741, 3950, 3951.

CAPE FLATTERY 92C

SUNRO MINE (No. 5, Fig. C)

By W. C. Robinson

LOCATION: Lat. 48° 26.5′ Long. 124° 02.2′ (92C/8E)
VICTORIA M.D. The mine is 1 mile north of the mouth of Jordan River.

(92C/8E)

CLAIMS: Approximately 50 Crown-granted claims including SUNLOCH, GABBRO, and VULCAN and the located claims COOK 1 to 20, RED 1 to 14, SUN 1 and 2 Fractions, and GAB 2, 3, and 4 Fractions.

ACCESS: One mile by road from the turnoff on Highway 14, one-half mile east of River Jordan Post Office.

OWNER: Pechiney Development Limited. (This company has an operating lease from Sunro Mines Ltd. to mine on 51 contiguous claims which cover the Cave, Central, and River ore zones.)

OPERATOR: JORDAN RIVER MINES LTD., 701, 744 West Hastings Street, Vancouver 1.

METALS: Copper, iron (production shown on Table I).

DESCRIPTION: Copper and iron mineralization occurs in shear zones in Metchosin volcanic rocks and in shear zones and as replacements in Sooke gabbro which intrudes the volcanic rocks. The main workings underlie the SUNLOCH NO. 6 (Lot 797) and GABBRO (Lot 825) Crown-granted claims.

WORK DONE: Drifting and crosscutting, 6,367 feet; raising, 789 feet; slashing, 36,919 tons; diamond drilling, 150 holes totalling 20,693 feet; and underground geological mapping, 1 inch equals 20 feet on Sunloch 6, Gabbro, and Gabbro Fraction; magnetometer survey, 1.5 line-miles covering parts of Vulcan 3 and Vulcan Fraction; geochemical soil survey, 197 samples covering Cook 8, 10, 12, and 14.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1950, p. 180; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 225.

LOSS (No. 93, Fig. C)

LOCATION: Lat. 48° 28'-29.5' Long. 124° 01.5'-10' (92C/8E)
VICTORIA M.D. Along the south sides of Loss and Rough Creeks, centred 5 miles northwest of River Jordan.

CLAIMS: LOSS 1 to 140, WOLF 1 to 12.

ACCESS: By logging roads from Highway 14.

OWNERS: D. PARENT, 4495 Wallace Street, Vancouver 8 and G. E. WHITE, c/o 925 Beckwith Road, Richmond (RIVER JORDAN SYNDICATE). Property optioned December 1972 to Kismet Mining Corporation Ltd.

METAL: Copper.

DESCRIPTION: Hornblendite and associated mineralization occur in northwesterly and in northeasterly trending shear zones cutting Tertiary gabbro and Metchosin volcanic rocks.

WORK DONE: Magnetometer survey, 84 line-miles and electromagnetic survey, 84 line-miles covering 112 claims; induced polarization survey, 12 line-miles covering 18 claims; geochemical survey, 1,750 samples covering 112 claims.

REFERENCE: Assessment Report 4104.

NAN (No. 8, Fig. C)

LOCATION: Lat. 48° 45′ Long. 124° 15′ (92C/9)
VICTORIA M.D. On Harris Creek, 15 miles northeast of Port Renfrew.

CLAIMS: LG, CW, totalling 40.

ACCESS: By logging road from Port Renfrew.

OWNER: LUCKY STRIKE MINES LTD., 711, 543 Granville Street, Vancouver 2.

METALS: Iron, copper.

DESCRIPTION: Magnetite and copper mineralization occurs along faults near limestone-volcanic contacts.

WORK DONE: Geological, magnetometer, and geochemical surveys.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 291 (NAN); Assessment Report 3849.

SUE, CATY, VAL (No. 7, Fig. C)

LOCATION: Lat. 48° 36′ Long. 124° 25′ (92C/9W)
VICTORIA M.D. At 300 feet elevation north of Port San Juan, 3 miles north of Port Renfrew.

CLAIMS: SUE, CATY, VAL, ED, totalling 66.

ACCESS: By road from Port Renfrew, 3 miles.

OWNER: PERBELL MINES LTD., c/o 107, 325 Howe Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Chalcopyrite and pyrrhotite occur in tuffaceous andesites and shales.

WORK DONE: Magnetometer survey, 22 line-miles during 1971.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 292; Assessment Report 3672.

REKO (No. 6, Fig. C)

LOCATION: Lat. 48° 38′-40′ Long. 124° 16.5′-20.5′ (92C/9W)
VICTORIA M.D. At approximately 1,700 feet elevation on Renfrew Creek, 8 miles northeast of Port Renfrew.

CLAIMS: REKO 1 to 66.

ACCESS: By highway and gravel logging road from Port San Juan, 10 miles.

OWNER: REAKO EXPLORATIONS LTD., 118, 815 West Hastings Street, Vancouver 1.

METALS: Copper, iron.

DESCRIPTION: In the Port San Juan area, limestone, presumably of Triassic age and a part of the Vancouver Group, has been metamorphosed to massive blue-grey crystalline marble by intrusion of Jurassic diorite and granodiorite. Scattered over the claims are several massive magnetite showings and occurrences of pyrite, pyrrhotite, and chalcopyrite. The main showings are on Reko 3, 4, and 10.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet covering Reko 1 to

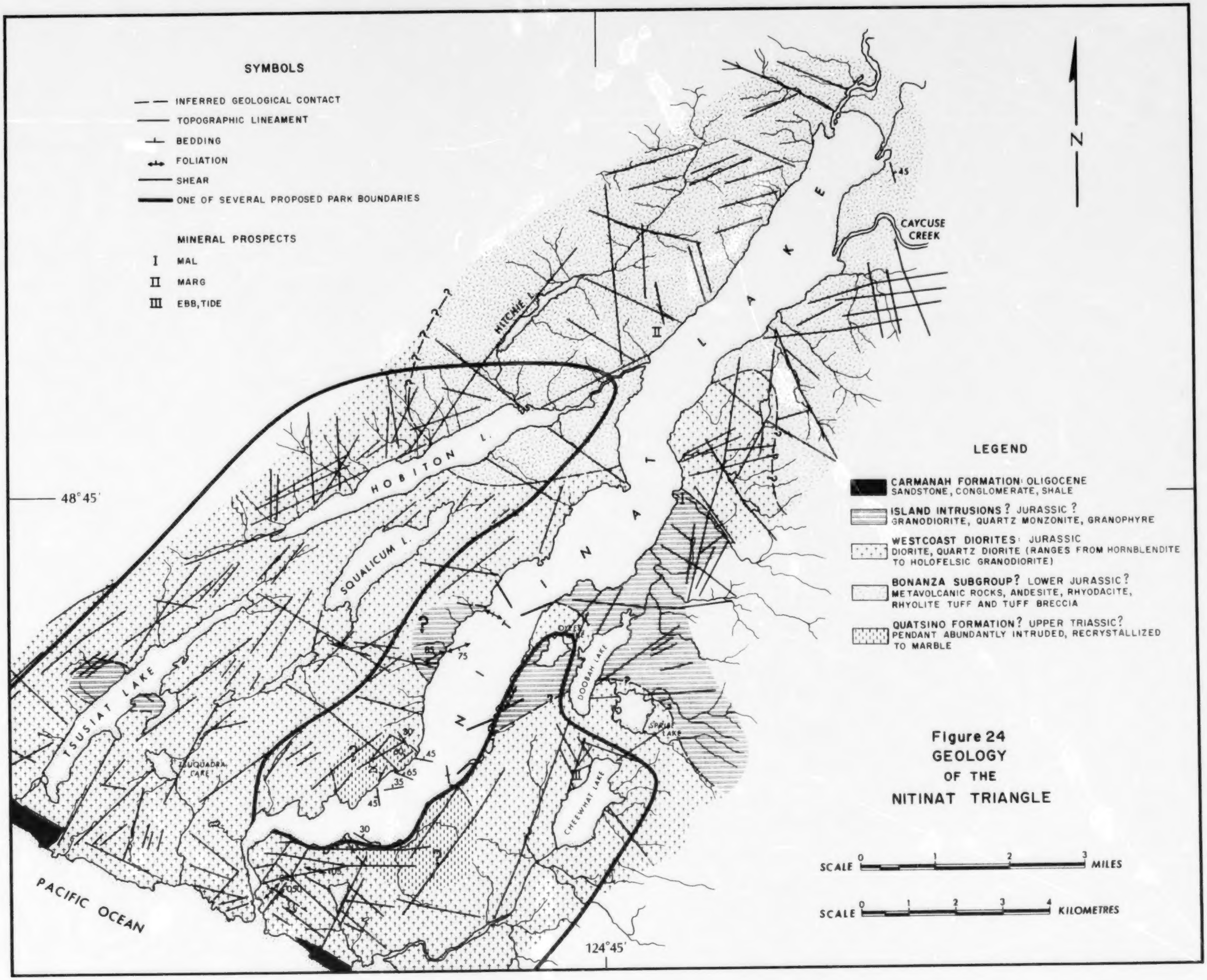

SYMBOLS
INFERRED GEOLOGICAL CONTACT
TOPOGRAPHIC LINEAMENT
BEDDING
FOLIATION
SHEAR
ONE OF SEVERAL PROPOSED PARK BOUNDARIES
MINERAL PROSPECTS
I MAL
II MARG
III EBB, TIDE
LEGEND
CARMANAH FORMATION: OLIGOCENE
SANDSTONE, CONGLOMERATE, SHALE
ISLAND INTRUSIONS? JURASSIC?
GRANODIORITE, QUARTZ MONZONITE, GRANOPHYRE
WESTCOAST DIORITES: JURASSIC
DIORITE, QUARTZ DIORITE (RANGES FROM HORNBLENDITE TO HOLOFELSIC GRANODIORITE)
BONANZA SUBGROUP? LOWER JURASSIC?
METAVOLCANIC ROCKS, ANDESITE, RHYODACITE, RHYOLITE TUFF AND TUFF BRECCIA
QUATSINO FORMATION? UPPER TRIASSIC?
PENDANT ABUNDANTLY INTRUDED, RECRYSTALLIZED TO MARBLE
N
NITINAT LAKE
CAYCUSE CREEK
HITCHIE L.
HOBITON L.
SQUALICUM L.
TSUSIAT LAKE
TUQUADRA LAKE
DOOBAH LAKE
SPRITE LAKE
CHEEWHAT LAKE
PACIFIC OCEAN
48°45′
124°45′
SCALE 0 1 2 3 MILES
SCALE 0 1 2 3 4 KILOMETRES

Figure 24
GEOLOGY
OF THE
NITINAT TRIANGLE

45; magnetometer survey, 50 line-miles covering Reko 1 to 48; electromagnetic survey, 50 line-miles covering Reko 1 to 48; trenching, 1,800 cubic feet on Reko 3, 4, 9, and 10; surface diamond drilling, four holes totalling 1,500 feet on Reko 3 and 4 and 10 holes totalling 2,500 feet on Reko 9 and 10.

THE GEOLOGY OF THE NITINAT TRIANGLE

By K. E. Northcote

A geological reconnaissance of the Nitinat Triangle was made during four weeks of the 1972 field season. The geology was mapped from bedrock exposures on logging roads, lakeshores, and in streams. Samples of pyritized zones encountered during mapping were chip sampled and assayed. Mineral prospects were examined and sampled and stream-silt samples were collected and analysed.

The area which was being considered for a park is outlined on Figure 24. The area included Tsusiat, Hobiton, and Squalicum Lakes, the south shore of Nitinat Lake from the coast to a point north of Oyees Lake, and included Cheewhat Lake and Cheewhat River.

GEOLOGY: The proposed park area is underlain mainly by Westcoast Diorites and Island Intrusions with a small area of Bonanza volcanic rocks included in the northernmost apex. The plutonic rocks apparently intrude Bonanza rocks with a gradational intrusive contact crossing just north of the mid point of Hobiton Lake and about two-thirds of the way up Nitinat Lake (Fig. 24).

Westcoast Diorites: The Westcoast Diorites form part of the Westcoast Crystalline Complex (Muller and Carson, 1969). The Westcoast Diorites consist of hybrid intrusive rocks showing wide variation in texture and composition (Fig. 25). Although the rocks are mainly quartz diorite-diorite composition they range from hornblendite to leucogranodiorite. Figure 25 shows only the modes of rock types representative of the bulk of the rocks. Modal analyses for Westcoast Diorites are listed in Table 1.

The hybrid quartz diorite-diorite ranges from fine to coarse grained, is leucocratic to mesocratic with hornblende generally in excess of biotite. Mafic minerals commonly occur in clusters giving the rock a spotted or clotted appearance. Plagioclase has poor to fair-developed normal zoning which shows a wide range of composition from An_{47} cores to albitic rims. Average composition appears to be about An_{37}. Quartz is inconspicuous in hand specimens but is visible in most thin sections. Disseminated pyrite and pyrite in veinlets with quartz and epidote are common (Plates VA and VB).

A notable characteristic of Westcoast Diorites is the superabundance of inclusions. Near the outer coast, particularly, the inclusions are drawn out producing a strong foliation. Inland the inclusions, although still abundant, are more irregular in shape and the foliation is less noticeable. Most of the inclusions were formerly volcanic rocks which were engulfed by Westcoast Diorites. The inclusions show all degrees of recrystallization and assimilation and are cut by numerous lighter coloured dykelets. Garnet-epidote-pyroxene skarns occur locally and probably represent altered limestone inclusions. Copper and magnetite mineralization shows a tendency to be localized in skarns.

Within the large area underlain by Westcoast Diorites are smaller areas of dark melanocratic fine-grained rock of diorite-quartz diorite composition which form large xenoliths and pendants of recrystallized, partly assimilated volcanic rocks and early, highly contaminated phases of intrusive rocks. These areas are abundantly cut by dykes and dykelets of light-coloured hybrid intrusive and locally exhibit 'giraffe-like' patterns. Pyrite is common as disseminations and veinlets in the volcanic pendants. A large mass of abundantly intruded marble is exposed on both sides of Nitinat Lake near the southern end (Fig. 24). The marble is coarse grained, recrystallized, and is of good purity (Table 4). The marble pendant probably represents Quatsino (?) limestone which has been engulfed by magma of the hybrid Westcoast Diorites. Pyrite-bearing siliceous rocks and skarn have resulted from interaction of magma and limestone and are associated with the marble pendant.

Sutherland Brown (1968, pp. 129-146) has described in detail syntectonic plutons of the Queen Charlotte Islands. His description shows that these syntectonic plutons are virtually identical to Westcoast Diorites in textures, composition, age, and origin (*op cit* and personal communication). Sutherland Brown (1968, p. 133) further states that described examples of these plutons are relatively rare with one other similar pluton, the Pinckneyville batholith of Alabama, described by Gault (1945, pp. 181-246).

Island Intrusions (?): A stock thought to represent Island Intrusions, locally called the Doobah stock, is centred northeast of Doobah and Sprise Lakes and crosses to the northwest side of Nitinat Lake (Fig. 24). The Doobah stock consists of medium to coarse-grained, weakly porphyritic, holofelsic to leucocratic, biotite (hornblende) granodiorite-quartz monzonite (Fig. 25 and Plate VIA). Plagioclase commonly shows no well-developed zoning and ranges from An_{30} to An_{38} in composition. One thin section from a sample from near the south edge of the stock shows strong zoning with few slight oscillations. Orthoclase is anhedral, interstitial, and perthitic. Mafic content is commonly less than 5 per cent with biotite equalling or in excess of hornblende. Modal analyses for the Doobah stock are plotted on Figure 25 and are listed on Table 1. Numerous dykes from the Doobah stock cut the hybrid Westcoast Diorites and the numerous xenoliths and pendants.

A small body of granodiorite-quartz monzonite similar to the Doobah stock occurs on the north side of Tsusiat Lake (Fig. 24). The southeast end of this body crosses Tsusiat Lake and has a granophyric texture. The granophyre is weakly porphyritic with plagioclase phenocrysts intergrown with and in a fine matrix of graphic textured orthoclase and quartz (Plate VIB). The Tsusiat granophyre is locally pyritized and iron stained.

The shoreline of the northeast part of Hobiton Lake, southwest of Hitchie Creek is comprised largely of pebbles and cobbles of porphyritic, holofelsic granophyre similar to although coarser grained than that exposed on Tsusiat Lake. This granopyric phase was not observed in place at Hobiton Lake.

ALTERATION: The intrusive rocks of the Nitinat Triangle show little evidence of pervasive alteration. There is localized saussuritization of early contaminated intrusive phases and widespread but weak chloritization, epidotization, and sericitization of mafic minerals and plagioclase feldspar.

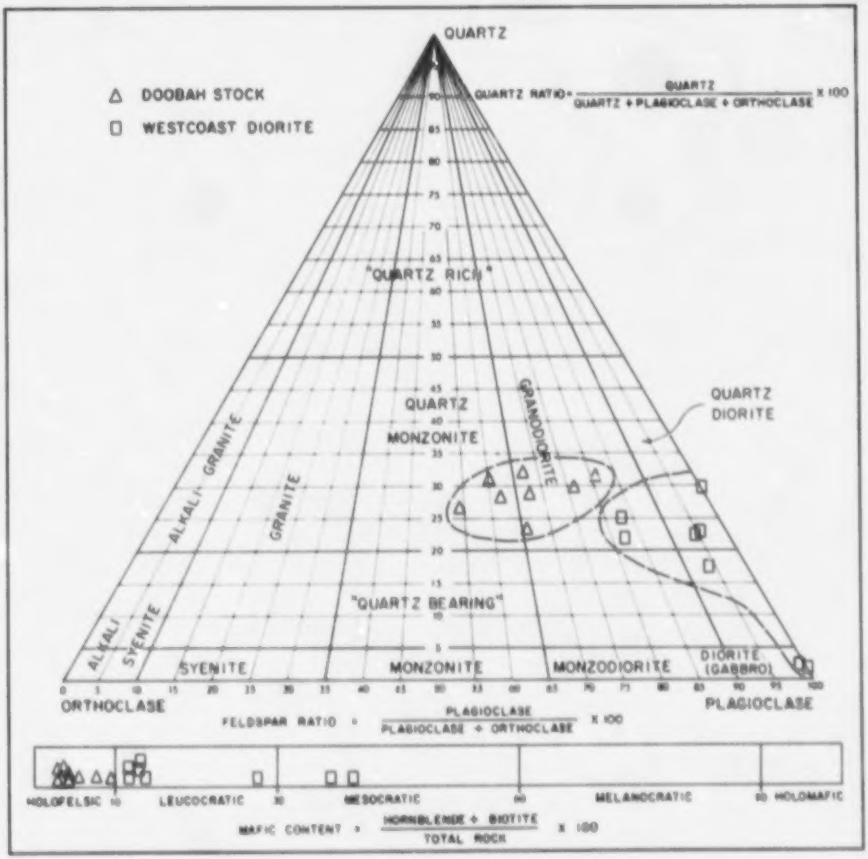


Figure 25. Classification of intrusive rocks, Nitinat Triangle (after A. L. Streikeisen).

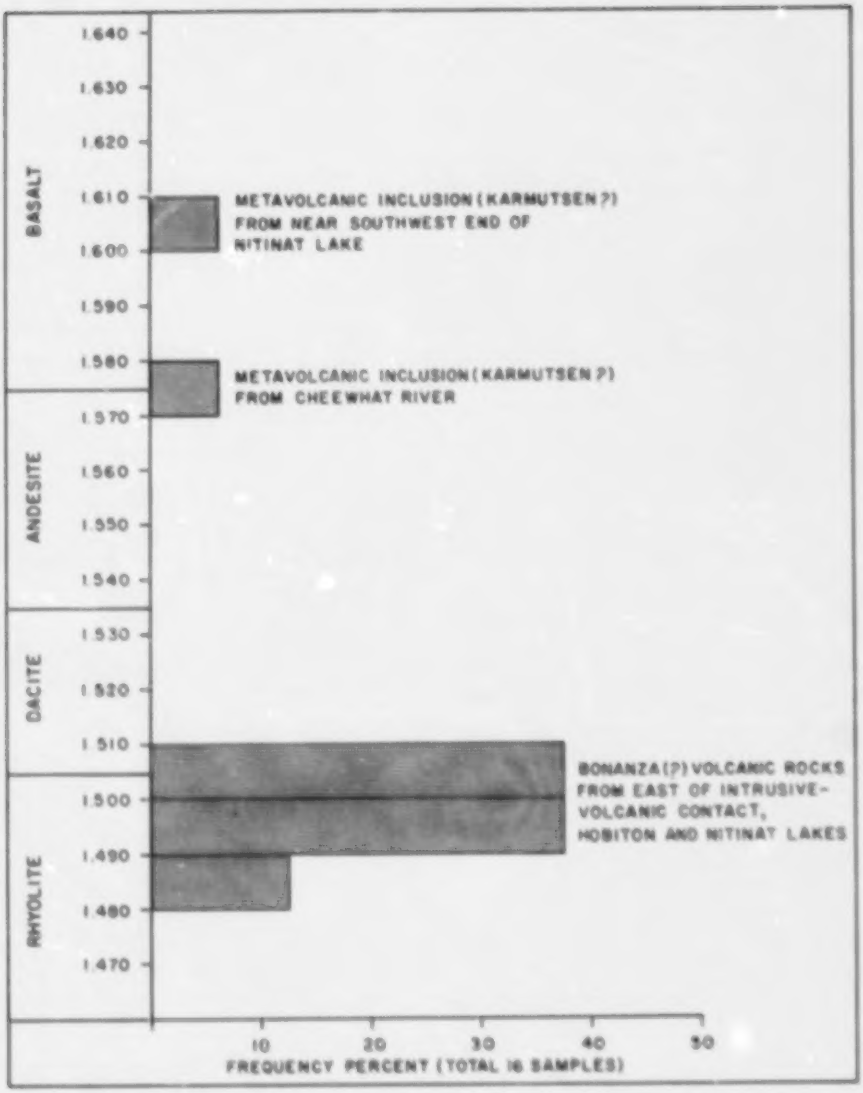
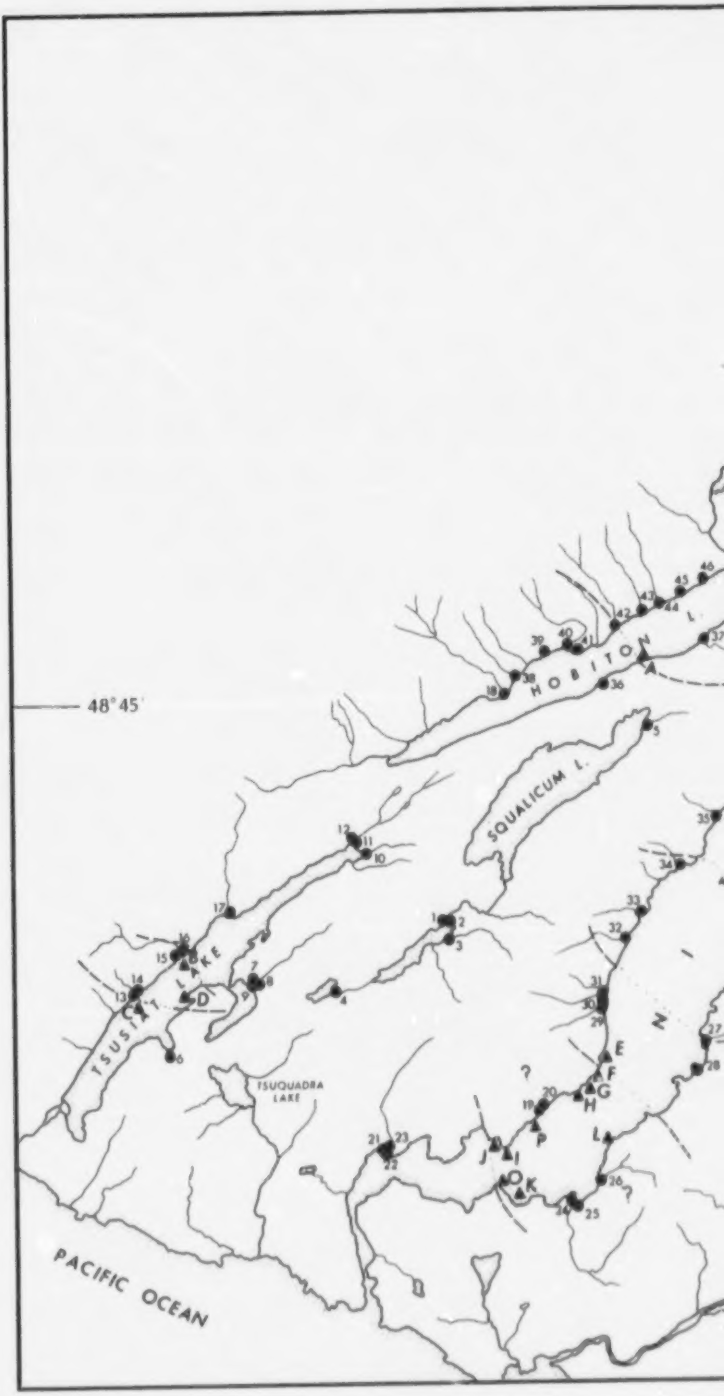


Figure 26. Refractive indices of fused Bonanza (?) volcanic rocks, Nitinat Triangle.



48°45'
HOBITON L.
SQUALICUM L.
TSUSIAT LAKE
TSUQUADRA LAKE
PACIFIC OCEAN
N
?
1
2
3
4
5
6
7
8
9
10
11
12
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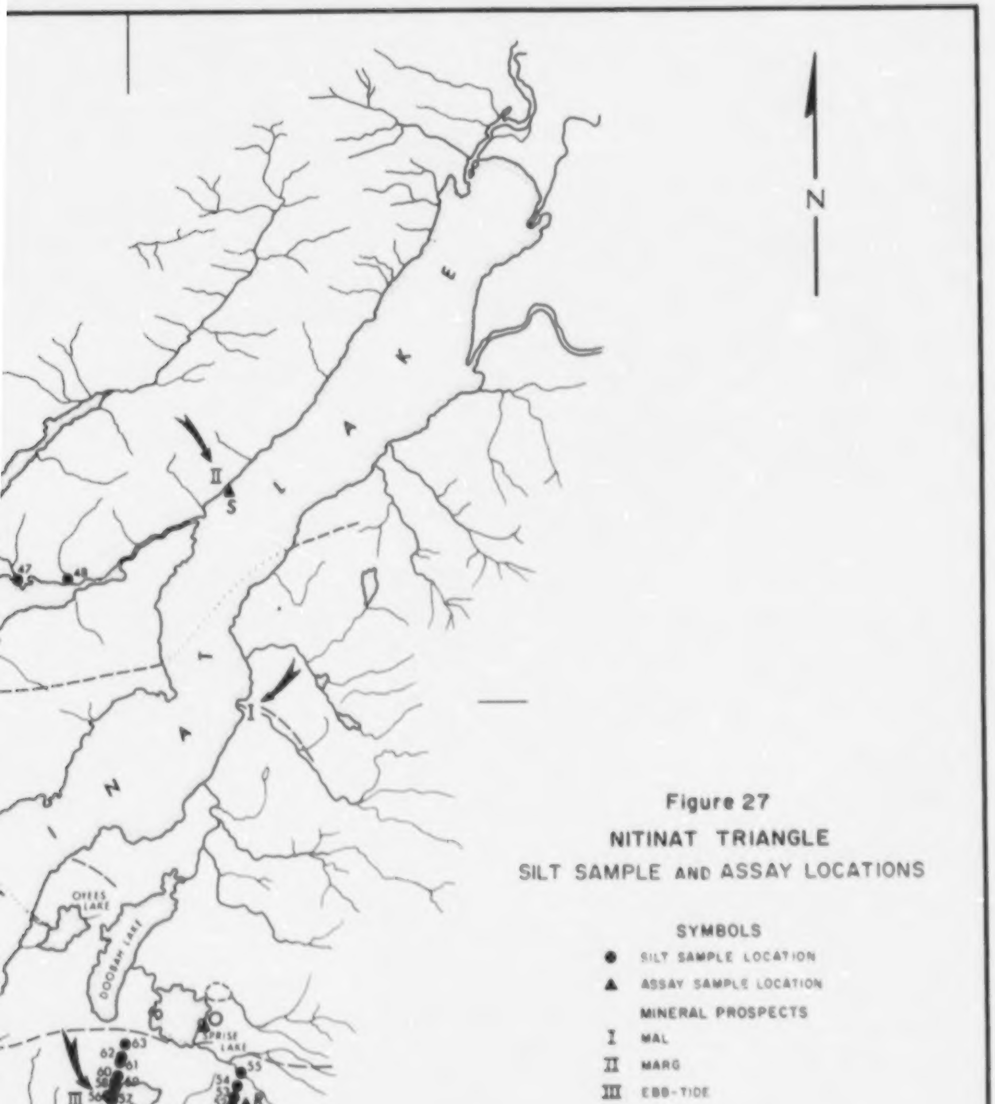

N
NITINAT LAKE
II
S
47
48
I
III
OYEES LAKE
DOOBAH LAKE
SPRISE LAKE
CHEEWHAT LAKE
63
62
61
60
59
58
56
57
55
54
53
52
51
50
49
R
Q
P
124°45'
SYMBOLS
● SILT SAMPLE LOCATION
▲ ASSAY SAMPLE LOCATION
MINERAL PROSPECTS
I MAL
II MARG
III EBB-TIDE
SCALE 0 1 2 3 MILES
SCALE 0 1 2 3 4 KILOMETRES

Figure 27
NITINAT TRIANGLE
SILT SAMPLE AND ASSAY LOCATIONS

INTRUSIVE HISTORY: The Westcoast Crystalline Complex is interpreted by Muller to have resulted from fusion of pre-Triassic rocks and brought about by an increase in thermal gradient in Early Jurassic time. Where the fused rock crystallized more or less in place rocks like the Wark Gneiss resulted (Muller, Northcote, and Carlisle, in press). In many areas, however, fusion of pre-Triassic rocks appears to have resulted in a mobile magma which penetrated upward into younger rocks, engulfing, recrystallizing, incorporating, and assimilating large amounts of this material. Hybrid intrusive rocks resulted which are abundantly charged with inclusions such as the Westcoast Diorites in the Nitinat area. Several phases of hybrid rocks occur. It is probable that the Westcoast Diorites were emplaced by a number of magmatic pulses with later magma cutting earlier intrusive phases. Differentiation of the hybrid magma occurred and resulted in emplacement and crystallization of younger more siliceous phases such as the Doobah stock. The Westcoast Diorites of the Westcoast Crystalline Complex and Island Intrusions may be comagmatic, with Island Intrusions representing a differentiated, less contaminated, less inclusion-charged equivalent of the Westcoast Diorites. Further, the Island Intrusions and Bonanza volcanic rocks are probably also comagmatic (Northcote and Muller, 1972).

Bonanza Subgroup: The contact between Westcoast Diorites and volcanic rocks of the Bonanza Subgroup appears to be intrusive and gradational and crosses the northeast part of the Nitinat Triangle (Fig. 24). Volcanic rocks within a mile of the contact are altered or metamorphosed and their original textures are largely obliterated. Some difficulty was experienced in the contact area distinguishing among Bonanza metavolcanic rocks, fine-grained dioritic dykes, and highly contaminated fine-grained diorite-quartz diorite intrusive rocks. At some distance from the contact, however, the pyroclastic textures of tuff and tuff breccia are preserved. The Bonanza rocks are intruded by very fine-grained to medium-grained dykes of diorite and quartz-bearing diorite composition.

Refractive indices of fused random samples of Bonanza volcanic rocks show they are mainly rhyolite-rhyodacite composition (Fig. 26). Dark-coloured metavolcanic rock exposures may originally have been of more basic composition. Thin sections of these darker tuffaceous rocks from near the intrusive contact show quartz veinlets and diffuse interstitial quartz among feldspar fragments. The refractive indices of fused glass from these rocks would indicate an anomalously acid composition. Tuff and tuff breccia on Hobiton River and on Nitinat Lake southwest of Caycuse River, however, appear relatively unaltered and were probably originally of their indicated rhyolite and rhyodacite composition.

STRUCTURE: Topographic lineaments from air photographs are superimposed on the lithology of Figure 24. The lineaments probably represent fracture and shear zones. A comparison of the position of lineaments with respect to geological contacts suggests no strong structural control.

Bedding in marble on both sides of Nitinat Lake is disturbed as a result of magmatic intrusion and proximity to shear zones paralleling Nitinat Lake.

GEOCHEMISTRY: Silt samples were collected from streams within the proposed park area at locations shown on Figure 27. The silt samples were dried, screened to –80 mesh, and analysed for copper, lead, zinc, and molybdenum using the following methods of analysis:

(a) Spectrographic analysis for total copper, zinc, lead, and molybdenum.

(b) Concentrated HNO_3 + $KClO_4$ and atomic absorption for total copper, zinc, and lead.

(c) 0.5 N. HCl and atomic absorption for hydromorphic copper, zinc, and lead.

(d) Colorimetric methods for total Mo.

The results of the analyses are listed in Table 2 and spectrographic analyses and 0.5 N. HCl:AA analyses for copper, zinc, and lead are plotted as histograms on Figure 28. The sample numbers of anomalous samples are noted on the figure.

Spectrographic and concentrated HNO_3 + $KClO_4$:AA methods for total metals show an increase in background for copper and zinc near the intrusive-volcanic contact at Hobiton Lake. The values for lead show more random variation with less marked increase in values at the intrusive-volcanic contact. Molybdenum values range between not detected and 19 ppm with sample numbers 38, 56, 61, and 62 giving values greater than 5 ppm. (Samples 61 and 62 are duplicate samples from the same stream.)

MINERALIZED OCCURRENCES: A number of pyritized zones within intrusive rocks, volcanic xenoliths and pendants, and in skarn associated with marble pendants were chip sampled and assayed. The locations of the samples are shown on Figure 27 and the assay results are tabulated in Table 3.

The marble pendant near the southwest end of Nitinat Lake was sampled and analysed for purity. The results of these analyses plus that of mathews and McCammon are tabulated on Table 4 (Mathews and McCammon, 1957, pp. 97, 98).

REFERENCES: Gault, H. R. (1945), Pinckneyville Quartz-Diorite, Alabama, *Geol. Soc. Am.,* Bull., Vol. 56, pp. 181-246; Mathews, W. H. and McCammon, J. W. (1957), Calcareous Deposits of Southwestern British Columbia, *B.C. Dept. of Mines,* Bull. 40; Muller, J. E., Northcote, K. E., and Carlisle, Donald (in press), Geology of Alert Bay-Cape Scott Map-area, *Geol. Surv., Canada,*; Northcote, K. E. and Muller, J. E. (1972), Volcanism, Plutonism, and Mineralization, Vancouver Island, *C.I.M.,* Bull., October, 1972; Sutherland Brown, A. (1968), Geology of the Queen Charlotte Islands, British Columbia, *B.C. Dept. of Mines & Pet. Res.,* Bull. 54.

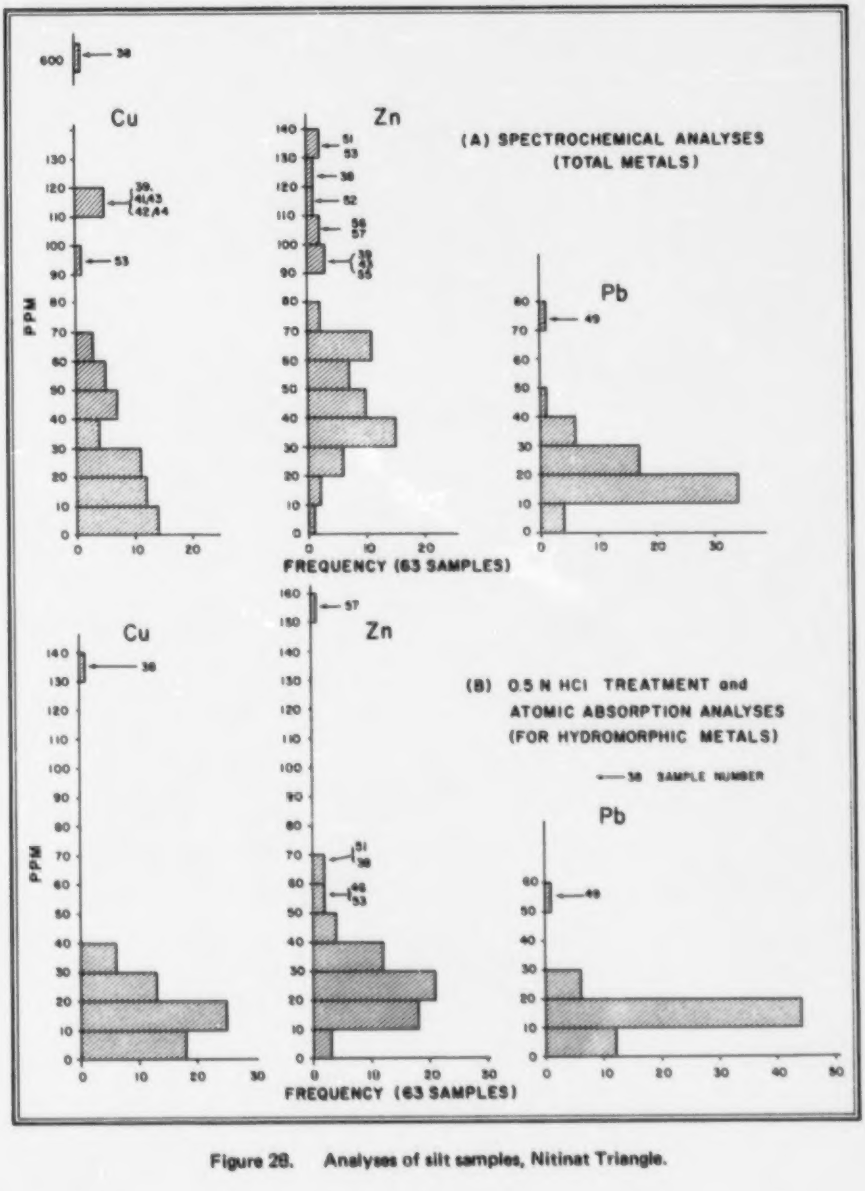


Figure 28. Analyses of silt samples, Nitinat Triangle.

Table 1. Modal Analyses

	WESTCOAST DIORITE								DOOBAH STOCK							
	72-KN-37	72-KN-44	72-KN-47	72-KN-37-I	72-KN-30-I	72-KN-33	72-KN-34	72-KN-89	72-KN-59	72-KN-65	72-KN-56	72-KN-49	72-KN-64	72-KN-53-II	72-KN-58	72-KN-82-I
Orthoclase	-----	3.3	12.4	-----	11.2	3.8	3.3	0.5	16.8	23.1	26.8	32.9	23.9	12.4	21.6	26.2
Plagioclase	60.2	55.9	55.3	57.0	53.9	63.2	62.8	59.1	51.8	41.5	39.4	37.8	45.1	50.7	45.3	43.4
Quartz	25.2	12.6	19.4	1.1	21.5	19.6	19.2	1.4	28.4	30.3	30.1	25.9	20.7	28.7	26.1	26.5
Biotite	8.8	6.1	10.2	0.9	9.8	4.3	8.9	2.5	2.3	2.9	4.1	0.7	9.6	7.8	5.5	1.4
Hornblende	3.0	21.7	1.7	38.6	3.2	7.8	5.0	34.4	0.5	1.2	0.1	2.9	-----	-----	-----	1.5
Opaque	2.5	0.6	0.7	2.2	0.6	1.1	1.0	2.1	0.2	1.4	0.3	-----	0.6	0.4	1.4	0.8

Table 2. Silt Geochemistry

Silt	Cu_{TSp}	Cu_T	Cu_W	Zn_{TSp}	Zn_T	Zn_W	Pb_{TSp}	Pb_T	Pb_W	Mo_{TSp}	Mo_{TCol}
1	14.3	------	12	48	------	34	41.5	----	30	N.D.	-------
2	9.5	------	10	44	------	34	28.6	----	22	N.D.	-------
3	14.3	------	10	58	------	17	14.5	----	13	1	-------
4	8.7	------	6	35	------	16	15	----	13	N.D.	-------
5	40	30	17	64	106	40	11	21	15	N.D.	-------
6	7.5	6	5	8	17	11	6.6	16	11	N.D.	-------
7	6	16	11	53	92	38	16.4	24	19	N.D.	-------
8	11.7	17	14	31	72	30	11.8	21	13	N.D.	-------
9	10	------	9	37	------	38	16.4	----	17	1	-------
10	5.2	17	13	19	41	17	6.4	18	9	N.D.	-------
11	7	8	4	60	51	21	7.6	15	10	N.D.	-------
12	7	------	6	50	------	25	15.5	----	11	N.D.	-------
13	3	10	5	31	27	11	25	24	16	1.8	-------
14	4	14	5	23	29	12	12.2	26	17	1	-------
15	5.2	------	4	42.5	------	7	10.5	----	8	1	-------
16	4.3	20	13	19	54	29	13	33	22	N.D.	-------
17	21	------	15	53	------	19	20.2	----	11	N.D.	-------
18	40	------	20	68	------	23	22.5	----	11	1	0.6
19	26	------	14	68	------	44	24.7	----	16	2	-------
20	14.2	------	14	66	------	50	19	----	17	1	-------
21	11.5	------	8	47	------	26	18.6	----	11	N.D.	-------
22	13.6	------	10	40	------	36	25.6	----	19	N.D.	-------
23	9	------	5	40	------	13	25.6	----	19	1	-------
24	22	------	13	31	------	17	20	----	11	1	-------
25	20	------	9	46	------	28	39	----	13	N.D.	-------
26	25	------	16	42	------	29	22.2	----	16	N.D.	-------
27	22.6	------	12	32	------	13	12.2	----	11	1	-------
28	23.7	------	22	34	------	10	13	----	15	N.D.	-------
29	16.2	------	11	40	------	13	20	----	11	1	-------
30	23.7	------	19	53	------	27	16.4	----	15	1	-------
31	35	------	18	41	------	23	25.6	----	11	3	-------
32	13.2	------	17	32	------	33	16	----	16	1	-------
33	48	------	20	64	------	19	27.6	----	12	N.D.	-------
34	25.3	------	17	26	------	37	14	----	13	N.D.	-------
35	17	------	18	42.5	------	50	17.3	----	18	N.D.	-------
36	68	------	37	40	------	38	16.4	----	12	N.D.	-------
37	53.5	------	18	66	------	27	17.7	----	11	1	-------
38	---------	650	140	127	------	62	38	----	24	5.4	5.3
39	112	------	29	97	------	21	14.5	----	16	1	0.9
40	53.5	------	34	29	------	26	14.5	----	20	1	4.5
41	114	79	34	61	95	25	28.6	45	21	N.D.	2.0
42	117	80	30	64	119	20	33.3	45	18	1	-------
43	112	59	29	96	80	17	15.5	36	10	N.D.	-------
44	114	62	24	64	97	25	28	42	17	1	-------

Table 2. Silt Geochemistry

Silt	Cu_{TSp}	Cu_T	Cu_W	Zn_{TSp}	Zn_T	Zn_W	Pb_{TSp}	Pb_T	Pb_W	Mo_{TSp}	Mo_{TCol}
45	50	------	19	54	------	22	30.5	----	15	1	-------
46	36	------	25	32	------	52	13.5	----	20	N.D.	-------
47	66	------	25	77	------	33	37.5	----	18	1	-------
48	43	------	30	26	------	47	27.2	----	16	N.D.	-------
49	42	34	23	70	82	37	71	90	57	-------	2.7
50	52	45	25	78	84	22	17	21	9	-------	1.5
51	68	54	39	134	140	66	15	22	8	-------	1.8
52	53	50	35	113	118	29	15	20	7	-------	1.1
53	94	56	36	131	156	60	25	38	17	-------	1.5
54	50	39	26	67	130	24	15	20	9	-------	1.4
55	57	45	25	98	102	20	16	19	7	-------	1.1
56	32	25	12	110	136	37	21	22	8	-------	9.7
57	20	23	27	105	108	160	30	21	27	-------	3.1
58	28	21	11	36	67	30	11	24	12	-------	2.9
59	41	33	20	41	62	15	19	32	16	-------	1.5
60	10	24	7	29	44	9	10	37	5	-------	2.4
61	17	15	7	28	43	16	14	21	9	-------	9.0
62	24	15	9	58	78	21	32	29	15	-------	13.3
63	21	12	8	34	36	13	26	27	14	-------	1.9

Table 4. Limestone (Marble) Analyses

	Sample O	Sample P	Mathews and McCammon (1957) (As for P)
	%	%	%
Insol.	1.46	2.38	3.38
R_2O_3	0.26	0.48	0.34
Fe_2O_3	0.11	0.24	0.17
MnO	0.01	0.017	0.006
MgO	0.28	0.32	0.39
CaO	54.95	54.15	53.3
P_2O_5	0.021	0.009	0.008
S	0.066	0.069	0.06
Ig. Loss	43.36	42.79	42.3
H_2O	0.12	0.08	0.16

Table 3. Assays of Chip Samples

	Au	Ag	Cu	Pb	Zn	Mo	Remarks
A	nil	nil	16 ppm	4.5 ppm	38 ppm	0.7 ppm	Metavolcanic, iron stain, rubble.
B-1	nil	nil	trace	N.D.	N.D.	...	Granophyre, pyrite, >100 feet^2.
B-2	nil	nil	0.015%	N.D.	N.D.	...	Granophyre, pyrite, >100 feet^2.
C	nil	nil	trace	N.D.	N.D.	...	Granophyre, pyrite, >100 feet^2.
D	...	...	trace	N.D.	N.D.	...	Granophyre, pyrite, >100 feet^2.
E	...	...	0.009%	N.D.	trace	...	Hornfels, chips across wide area.
F	nil	nil	21 ppm	13 ppm	58 ppm	57.5 ppm	Marble, intrusive, pyrite, >100 feet^2.
G	nil	nil	270 ppm	6.5 ppm	67 ppm	7.5 ppm	Intrusive in limestone, pyrite, 20-foot width.
H	nil	nil	70 ppm	7.5 ppm	30 ppm	5.3 ppm	Silica-rich, pyrite, >25 feet^2.
I	nil	nil	203 ppm	4 ppm	60 ppm	1.5 ppm	Skarn, >100 feet^2.
J	trace	nil	84 ppm	12.5 ppm	82 ppm	10 ppm	Skarn, rubble, pyrite.
K	trace	nil	60 ppm	3.5 ppm	40 ppm	7 ppm	Intrusive cutting limestone, >100 feet^2.
L	trace	nil	48 ppm	5.3 ppm	140 ppm	15 ppm	Skarn, pyrite, >100 feet^2.
M	nil	nil	15 ppm	3 ppm	27 ppm	1.5 ppm	Metavolcanic, >100 feet^2.
N	trace	nil	40 ppm	2 ppm	27 ppm	N.D.	Marble, pyrite, >100 feet^2.
O-1	...	0.6 ppm	90 ppm	9 ppm	91 ppm	<0.7 ppm	Pyritized intrusive, broken rock in pit.
O-2	...	0.4 ppm	98 ppm	7 ppm	89 ppm	2 ppm	Pyritized intrusive, across 4 feet.
O-3	...	0.5 ppm	86 ppm	6 ppm	91 ppm	1 ppm	Pyritized intrusive, across 10 feet.
P	<0.1 ppm	0.35 ppm	365 ppm	5 ppm	41 ppm	1.4 ppm	Quarry, pyritized intrusive, selected samples.
Q	...	0.5 ppm	70 ppm	5 ppm	80 ppm	1 ppm	Pyritized intrusive, across 10 feet.
R	...	0.35 ppm	76 ppm	5 pp,	84 ppm	0.75 ppm	Pyritized intrusive, selected samples.

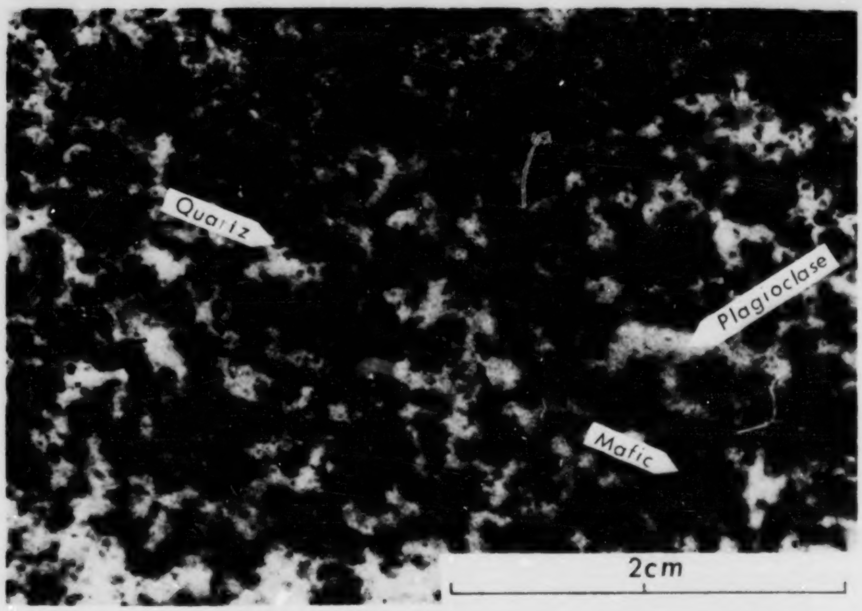


Plate VA. Westcoast Diorite (72-KN-39). Quartz diorite, medium grained, more than 10 per cent interstitial quartz grains; mafic minerals, 20 per cent as aggregates of fine grains, hornblende more than biotite, and 1 to 2 per cent magnetite with traces of pyrite.

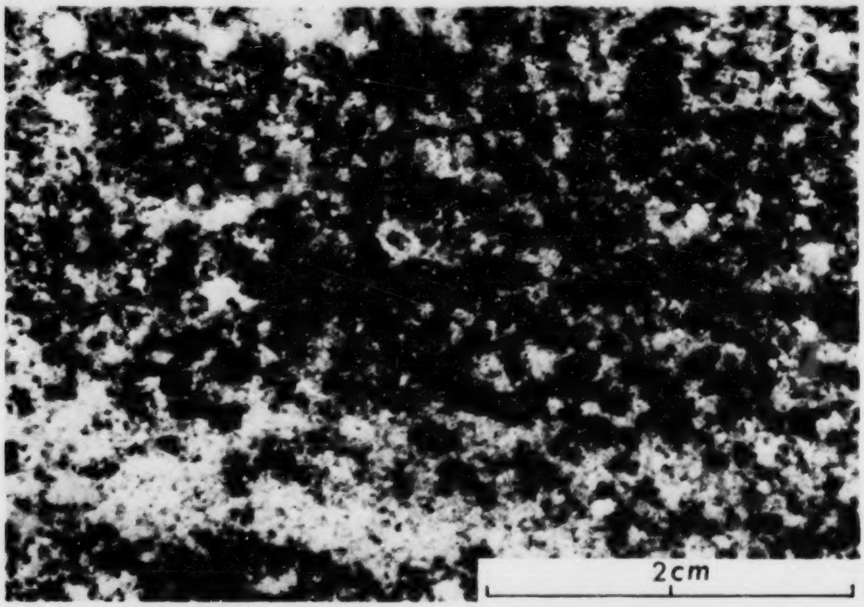


Plate VB. Westcoast Diorite (72-KN-30-I). Granodiorite, mafic rich and mafic poor layers, fine to medium grained, more than 20 per cent interstitial quartz, more than 10 per cent interstitial orthoclase, 10 to 15 per cent mafic minerals with biotite more than hornblende, less than 1 per cent magnetite.

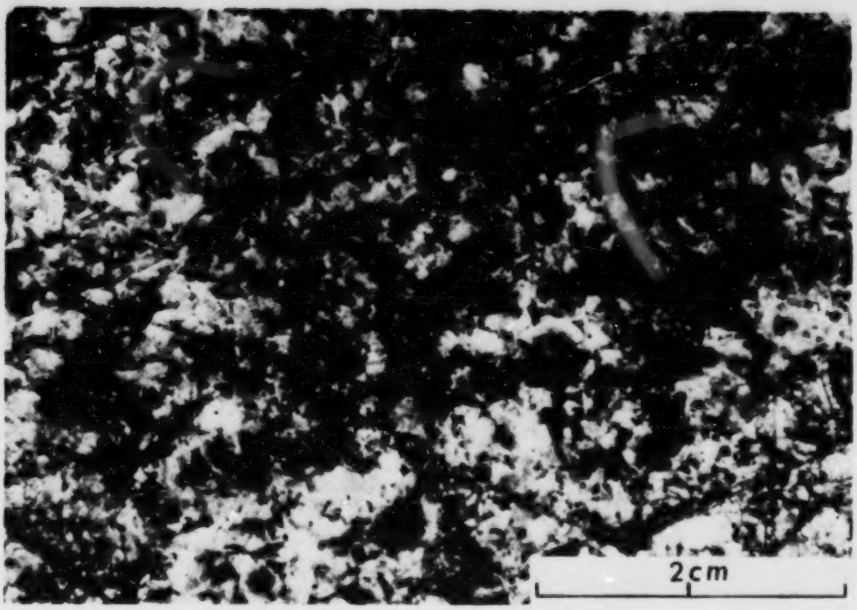


Plate VIA. Doobah stock (72-KN-82-I). Granodiorite – quartz monzonite; medium to coarse grained, weakly porphyritic, holofelsic, biotite more than hornblende; orthoclase 26 per cent and quartz 26 per cent; both are finer grained than and interstitial to plagioclase.

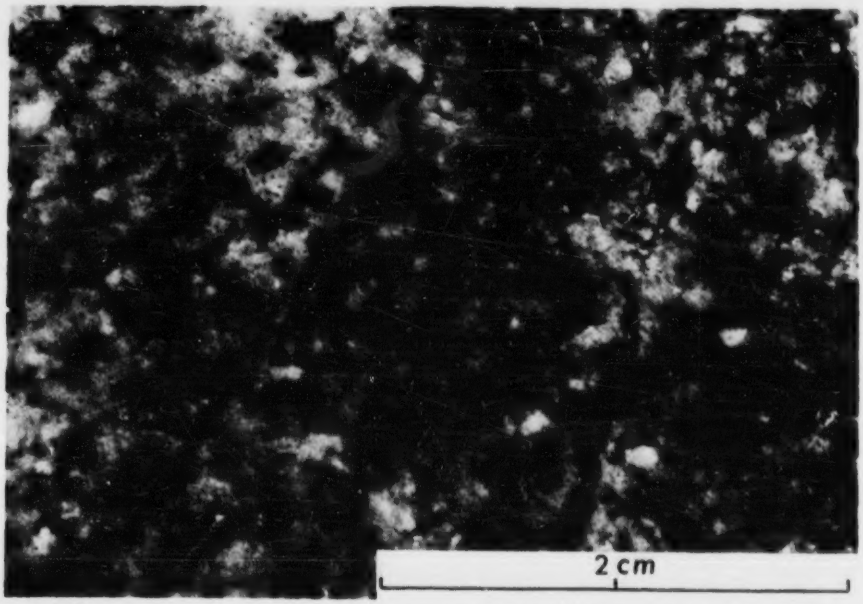


Plate VIB. Tsusiat granophyric quartz monzonite (72-KN-91). The granophyre is weakly porphyritic with plagioclase phenocrysts intergrown with and in a fine matrix of graphic textured orthoclase and quartz.

(92C/10E)

MAL (No. 119, Fig. C)

By K. E. Northcote

LOCATION: Lat. 48° 44.8' Long. 124° 43.3' (92C/10E)
VICTORIA M.D. On Marchand Creek on east side of Nitinat Lake, 1,000 feet from lakeshore (Figs. 24 and 27).

CLAIMS: MAL, totalling seven.

ACCESS: By logging roads, either from Port Alberni or from Lake Cowichan, to the head of Nitinat Lake and thence by boat 5.5 miles to the property.

OWNER: SHALMAR RESOURCES LIMITED (formerly Marshall Creek Copper Co. Ltd.), 2965 Glen Lake Road, Victoria.

METALS: Copper, zinc.

DESCRIPTION:

Copper and zinc mineralization occurs within lenses and bands up to 2 feet wide, mostly less, within a 25-foot shear zone, attitude 130 degrees/75 degrees northeast. Mineralization consists of pyrite, chalcopyrite, and sphalerite. Thuringite (?) was reported by McKechnie (*Minister of Mines, B.C.*, Ann. Rept., 1963).

The country rock consists of contaminated coarse-grained quartz monzonite of the Doobah stock containing abundant xenoliths and inclusions of saussuritized quartz diorite (?) of the Westcoast Diorites and volcanic rocks. These rocks are cut by several southeast-trending, steeply dipping, slightly porphyritic andesite dykes. One such dyke occurs within the mineralized shear zone in Marchand Creek.

WORK DONE: A few feet of packsack drilling was reported during the year.

REFERENCES: *Minister of Mines, B.C.*, Ann. Repts., 1963, p. 123; 1964, p. 168; 1965, p. 239; 1966, p. 78.

EBB, TIDE (No. 94, Fig. B)

By K. E. Northcote

LOCATION: Lat. 48° 42' Long. 124° 45' (92C/10)
VICTORIA M.D. At Doobah, Cheewhat, and Sprise Lakes, 1.5 miles east of Nitinat Lake, at elevations from 100 to 400 feet.

CLAIMS: EBB, TIDE, IT, totalling 50 claims.

ACCESS: By logging road to Nitinat Lake, then by boat to the logging camp at Doobah Creek and by logging road for 3 miles and then by trail for about 1 mile.

OWNER: DOOBAH MINING LTD., 1722 Bernard Avenue, Kelowna.

METALS: Copper (silver, zinc).

DESCRIPTION:

Figure 29 is a sketch map of the Ebb-Tide prospect. The claims are underlain by hybrid quartz diorite and diorite of the Westcoast Diorites which contain an abundance of inclusions of volcanic and sedimentary origin. The inclusions of volcanic rocks are fine grained, dark green-grey and show all stages of recrystallization and assimilation. Of particular interest are discrete 'blocks' of garnetite and epidote-garnet-diopside skarn which can be seen within the hybrid intrusive rocks forming the knob on which the mineralization occurs. These garnet-rich inclusions are thought to represent former limestone xenoliths which were caught up and altered by the magma of the Westcoast Diorites.

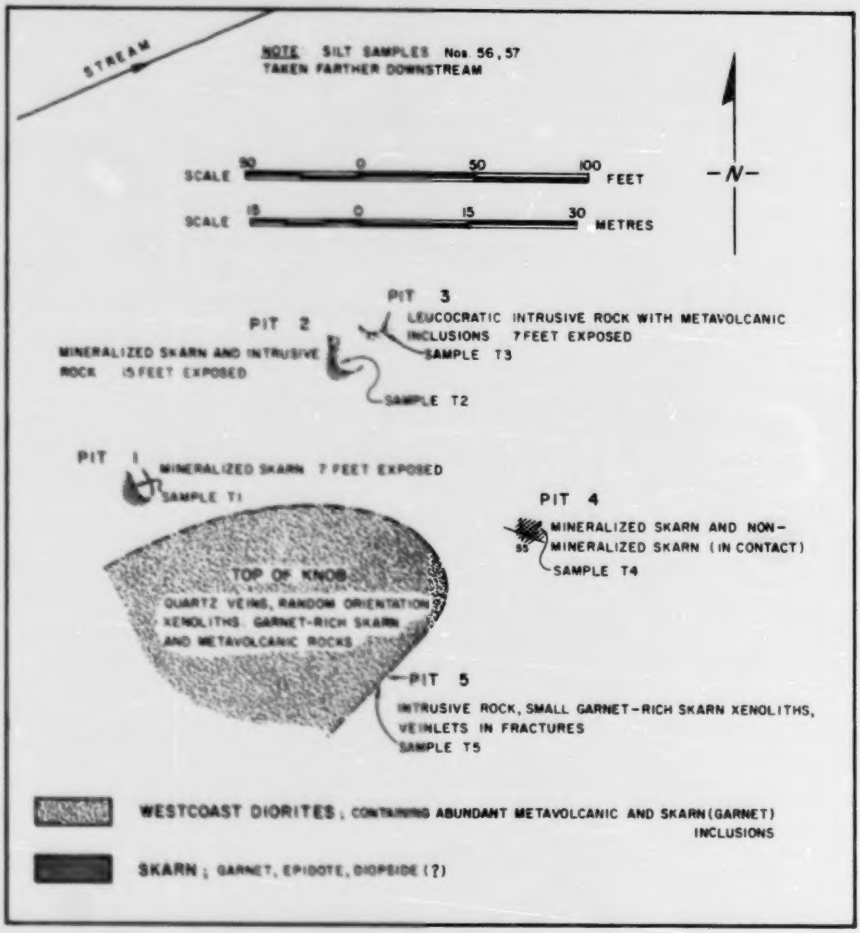

STREAM
NOTE: SILT SAMPLES Nos. 56, 57
TAKEN FARTHER DOWNSTREAM
SCALE
50
0
50
100
FEET
SCALE
15
0
15
30
METRES
N
PIT 3
LEUCOCRATIC INTRUSIVE ROCK WITH METAVOLCANIC
INCLUSIONS 7 FEET EXPOSED
SAMPLE T3
PIT 2
MINERALIZED SKARN AND INTRUSIVE
ROCK 15 FEET EXPOSED
SAMPLE T2
PIT 1
MINERALIZED SKARN 7 FEET EXPOSED
SAMPLE T1
PIT 4
MINERALIZED SKARN AND NON-
MINERALIZED SKARN (IN CONTACT)
55
SAMPLE T4
TOP OF KNOB
QUARTZ VEINS, RANDOM ORIENTATION
XENOLITHS: GARNET-RICH SKARN
AND METAVOLCANIC ROCKS
PIT 5
INTRUSIVE ROCK, SMALL GARNET-RICH SKARN XENOLITHS,
VEINLETS IN FRACTURES
SAMPLE T5
WESTCOAST DIORITES; CONTAINING ABUNDANT METAVOLCANIC AND SKARN (GARNET) INCLUSIONS
SKARN; GARNET, EPIDOTE, DIOPSIDE (?)

Figure 29. Location of pits on Ebb, Tide prospect (corresponds to III on Figure 24).

(92C/14E)

Chalcopyrite and pyrite mineralization occurs in a garnet-epidote-diopside skarn in association with intrusive rocks exposed in pits 1, 2, and 4 and in small skarn inclusions and in fractures at 5. Results of assays for chip samples from each of the pits are tabulated in the table.

Sample No.	Au *oz. per ton*	Ag *oz. per ton*	Cu %	Zn* %	Width
T-1	trace	0.4	1.92	0.03	across 7 feet
T-2	trace	trace	0.47	0.25	across 15 feet
T-3	0.02	trace	0.01*	0.06	across 7 feet
T-4	0.01	nil	0.025*	0.01	across 4.5 feet
T-5	0.01	trace	0.15	0.07	¼-inch veins

*Spectrochemical analyses.

WORK DONE: Surface geological mapping; trenching, 41 feet.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 222 (OC, RW, IT, ULL); 1971, p. 226.

DA (No. 12, Fig. C)

LOCATION: Lat. 48° 51.2′ Long. 125° 02.7′ (92C/14E)
ALBERNI M.D. Between 1,400 and 1,900 feet elevation on the south slope of Pachena Cone, 24 miles east-southeast of Ucluelet.

CLAIMS: DA 1 to 7.

ACCESS: By road from Port Alberni, 50 miles.

OPERATOR: KEEVIL MINING GROUP LIMITED, 7th Floor, 1177 West Hastings Street, Vancouver 1.

METALS: Molybdenum, copper.

DESCRIPTION: Disseminated molybdenite and chalcopyrite occur in a complex stock.

WORK DONE: Geological and geochemical surveys.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 226; Assessment Report 3794.

MARG (No. 120, Fig. C) By K. E. Northcote

LOCATION: Lat. 48° 46.8′ Long. 124° 43.3′ (92C/15E)
VICTORIA M.D. On northwest side of Nitinat Lake, 5 miles from northeast end (Figs. 24 and 27).

CLAIMS: MARG 1 to 4.

ACCESS: By logging roads, either from Port Alberni or from Cowichan Lake.

OWNER: GUSTAV JONASSON, 636 Tenth Avenue South, Port Alberni.
METALS: Copper (iron).
DESCRIPTION:

Pyrite, chalcopyrite, and minor magnetite mineralization occurs within quartz, epidote, chlorite veinlets and fracture fillings in saussuritized, pyritized, iron-stained Bonanza pyroclastic rocks. The attitude of the veinlets is varied and most are a small fraction of an inch in width. The Bonanza rocks are cut by dykes of diorite-quartz diorite composition. Pyritization and alteration of the volcanic rocks appear to be related to the dykes.

Chip samples at 6-inch intervals were taken from several zones of the most intensely veined copper mineralized and pyritized country rocks. The results are tabulated in the table.

Sample No.	Au	Ag	Cu	Pb	Zn	Width feet	Type
S- 1	nil	nil	trace	trace	N.D.*	25	Epidote and pyrite and some chalcopyrite on slip surfaces.
S- 2	nil	nil	0.008%	N.D.	N.D.	25	Epidote and pyrite and some chalcopyrite on slip surfaces.
S- 3	nil	trace	0.11 %	N.D.	N.D.	---	Mineralized vein.
S- 4	nil	nil	trace	trace	N.D.	30	Pyritized Bonanza.
S- 5	nil	nil	trace	N.D.	N.D.	50	Pyritized Bonanza ?.
S- 6	nil	nil	trace	N.D.	N.D.	50	Pyritized Bonanza ?.
S- 7	trace	trace	trace	N.D.	N.D.	85	Pyritized Bonanza ?.
S- 8	nil	nil	trace	N.D.	N.D.	85	Pyritized Bonanza ?.
S- 9	nil	nil	0.05 %	trace	---	---	Mineralized vein.
S-10	trace	nil	<0.03 %	---	---	---	Pyrite.

*N.D. – not detected by spectrographic analysis.

JD, MARC (No. 125, Fig. C)

LOCATION: Lat. 48° 48'-49' Long. 124° 34'-36' (92C/15E)
VICTORIA M.D. Between 500 and 2,000 feet elevation 3 miles east of the north end of Nitinat Lake.

CLAIMS: JD, JD 1 to 19, 21, 23 to 35, MARC 3 to 8.

ACCESS: By road from Lake Cowichan, 30 miles.

OWNER: MARSHALL CREEK COPPER CO. LTD., 2965 Glen Lake Road, Victoria.

METAL: Copper.

DESCRIPTION: The claims are underlain by rocks of the Bonanza Subgroup.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet covering JD 6 to 9 and 16 to 19.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 228 (Pan, JD).

TAM, EASY (No. 10, Fig. C)

LOCATION: Lat. 48° 50.5' Long. 124° 35.2' (92C/15E)
VICTORIA M.D. At approximately 2,000 feet elevation 4.5 miles east-northeast of the north end of Nitinat Lake.

CLAIMS: TAM 1 to 40, EASY 13 to 28, 37 to 52, D, E, and J Fractions.

ACCESS: By the Nitinat Lake logging road from Caycuse.

OWNER: HUDSON BAY EXPLORATION & DEVELOPMENT CO. LTD., 1695, 555 Burrard Street, Vancouver 1.

METALS: Copper, lead, zinc.

DESCRIPTION: Pyrite and chalcopyrite mineralization occurs mainly in shears and fractures in altered volcanic rocks. A few narrow veins of galena and sphalerite with pyrite occur near the north end of the property.

WORK DONE: 1971 – induced polarization survey covering the central 18 claims; 1972 – electromatnetic survey, 17 line-miles; geochemical soil survey, 55 samples; 3 miles of walking trail established; trenching 50 feet on Tam 2; surface diamond drilling, seven holes totalling 596 feet on Tam 7, 8, and 16.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 227; Assessment Reports 3025, 3649.

NI (No. 11, Fig. C)

LOCATION: Lat. 48° 53.5' Long. 124° 42' (92C/15E)
ALBERNI M.D. At approximately 1,000 feet elevation on the west side of the Little Nitinat River, 4 miles north of the north end of Nitinat Lake.

CLAIMS: NI 1 to 20, NI 1 to 8 Fractions.

ACCESS: By road from Port Alberni, 30 miles.

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.

METALS: Copper, lead, zinc.

(92C/15E)

DESCRIPTION: The claims are underlain by andesite, basalt, breccia, and limestone of the Vancouver Group intruded by basalt dykes. The rocks are locally intensely altered by sericite, chlorite, carbonate, and silica. Two major faults cut these rocks. Mineralization consists of bornite, chalcopyrite, galena, sphalerite, and pyrite.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet covering Ni 1-10 and Ni 1-4 Fractions; geochemical soil survey, 184 samples covering Ni 1-11, 17, 18, and NI 1-4 and 8 Fractions; geochemical rock survey, 47 samples covering Ni 1-4, 8-10 and Ni 2 and 4 Fractions.

REFERENCES: Assessment Reports 2019, 4279.

SOUTHERN CROSS (No. 126, Fig. C)

LOCATION: Lat. 48° 55.3' Long. 124° 35.8' (92C/15E)
ALBERNI M.D. Six miles west of the west end of Cowichan Lake.

CLAIMS: ROB 1 to 60, ROB 1 and 2 Fractions.

ACCESS: By 40 miles of logging roads west from the village of Lake Cowichan.

OWNER: Amax Exploration, Inc.

OPERATOR: DICTATOR MINES LTD., 1, 558 Howe Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Chalcopyrite, bornite, and pyrite are associated with skarn at contacts between feldspar porphyry dykes and intervolcanic limestone.

WORK DONE: Geological, geochemical, magnetometer, and electromagnetic surveys.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 227; Assessment Reports 3723, 4105.

NOOTKA 92E

K (No. 22, Fig. C)

LOCATION: Lat. 49° 21.7' Long. 126° 17.5' (92E/8W)
ALBERNI M.D. On the west side of Refuge (Hot Springs) Cove.

CLAIMS: K, totalling 61.

ACCESS: By boat or aircraft from Tofino.

OPERATOR: FLOREX MINING CO. LTD., 149 East 15th Street, North Vancouver.

METALS: Copper, zinc.

DESCRIPTION: Chalcopyrite occurs as stringers and blebs along a shear zone in epidotized andesite and sphalerite occurs in a shear zone in quartzite or silicified andesite.

WORK DONE: Geological, geochemical, and magnetometer surveys on the southwestern portion of the claim group.

REFERENCE: Assessment Report 3750.

SYDNEY (No. 23, Fig. C)

LOCATION: Lat. 49° 24.3′ Long. 126° 16′ (92E/8W)
ALBERNI M.D. The claims are centred 1 mile north of Hot Springs Cove.
CLAIMS: SYD 1 to 21.
ACCESS: By boat or aircraft from Tofino, 25 miles.
OPERATOR: WESTERN MINES LIMITED, 870, One Bentall Centre, 505 Burrard Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: A mineralized Tertiary stock is in intrusive contact with Bonanza sedimentary and volcanic rocks.
WORK DONE: Surface geological mapping, 1 inch equals 400 feet; geochemical soil survey, 150 samples.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, pp. 231, 232.

HESQUIAT, SATCHIE (No. 95, Fig. C)

LOCATION: Lat. 49° 30′ Long. 126° 23′ (92E/8W, 9W)
ALBERNI M.D. Between sea-level and 100 feet elevation on the east side of Hesquiat Lake, 33 miles northwest of Tofino.
CLAIMS: HESQUIAT 5 to 9, SATCHIE 2 to 7, BROWN JUG 1 to 6, HESTERVAN 1, 10 to 12, ESTEVAN 1 to 9, HES 1 to 5.
ACCESS: By boat from Tofino, 33 miles.
OWNER: TEXADA MINES LTD., 407, 1111 West Georgia Street, Vancouver 5.
METALS: Copper, iron.
DESCRIPTION: Disseminations and veins of chalcopyrite, bornite, and magnetite occur in skarn in volcanic rocks.
WORK DONE: Magnetometer survey, 5 line-miles covering Hes 1-5 and Hestervan 10 and 12; line-cutting, 12,200 feet covering same claims.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 216; Assessment Report 4103.

ORMOND, CONTACT (No. 20, Fig. C)

LOCATION: Lat. 49° 16.5′-18′ Long. 126° 03′-06.5′ (92E/8E)
ALBERNI M.D. Between sea-level and 1,150 feet elevation at Matilda Inlet, southeastern Flores Island.
CLAIMS: ORMOND 1 to 32, CONTACT, CONTACT 1 to 4.
ACCESS: By boat or aircraft from Tofino, 13 miles.
OWNER: LORNE HANSEN, 803, 1636 Haro Street, Vancouver 5.
METALS: Copper, zinc, silver, gold, iron.
DESCRIPTION: Skarn is reported containing sulphide mineralization and lenses of magnetite.
WORK DONE: Road construction, 1.5 miles on Contact; trenching, 100 feet on Contact 1; stripping, 300 feet by 400 feet on Contact and Contact 1.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 216; Assessment Report 465.

JR (No. 21, Fig. C)

LOCATION: Lat. 49° 19.3′ Long. 126° 07.7′ (92E/8E)

ALBERNI M.D. At approximately 1,000 feet elevation near the centre of Flores Island.

CLAIMS: JR 1 to 14, SNOW 1 to 8, SC 1 to 8, FI 1 to 12.

ACCESS: By air from Tofino, 15 miles.

OPERATOR: WESTERN MINES LIMITED, 870, One Bentall Centre, 505 Burrard Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The claims are underlain by Tertiary intrusive rocks ranging from quartz diorite to granite and aplite.

WORK DONE: Florex Mining Co. Ltd. conducted geological, geochemical, and magnetometer surveys covering the JR claims during the early part of the year. Western Mines Limited did surface geological mapping and geochemical soil surveying covering JR, Snow, SC, and FI claims.

REFERENCES: Assessment Reports 3689, 4356.

HK (No. 128, Fig. C)

LOCATION: Lat. 49° 58′ Long. 126° 19′ (92E/16W)

NANAIMO M.D. On Tolnai Creek at 2,200 feet to 3,000 feet elevation, 7 miles north-northwest of the western end of Muchalat Lake.

CLAIMS: HK 1 and 2.

ACCESS: By logging roads, 20 miles north and west from Gold River.

OPERATOR: FIRST NATIONAL MINES LIMITED, 185 Davenport Road, Toronto, Ont.

METAL: Copper.

DESCRIPTION: A vein-like body of massive chalcopyrite cuts skarn at contacts between Karmutsen volcanic rocks and Island Intrusions.

WORK DONE: Reconnaissance geological mapping.

REFERENCES: Assessment Reports 728, 4102.

VANHALL, DV (No. 127, Fig. C)

LOCATION: Lat. 49° 55′ Long. 126° 00′ (92E/16E; 92F/13W)

ALBERNI M.D. On the southwest slope of Horseshoe Mountain, 9.5 miles north of Gold River.

CLAIMS: VANHALL 1 to 6, DV 1 to 30, 73, 74, 76, 78.

ACCESS: By helicopter from Campbell River, 30 miles.

OPERATOR: MORESBY MINES LIMITED, 1110, 1055 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Chalcopyrite and pyrite are disseminated in Karmutsen volcanic rocks and in a dacite porphyry dyke.

WORK DONE: Geochemical soil survey, 548 samples.

REFERENCES: Assessment Reports 2436, 3953.

LD (No. 13, Fig. C)

LOCATION: Lat. 49° 11.0' Long. 125° 19.0' (92F/3W)
ALBERNI M.D. Between 1,200 and 2,800 feet elevation 2 miles northwest of Effingham Lake.

CLAIMS: DL 1 to 60.

ACCESS: From Highway 4, some 5 miles north of Kennedy Lake, then 4 miles east up a logging road.

OWNER: Mount Washington Copper Co. Ltd.

OPERATOR: PHELPS DODGE CORPORATION OF CANADA, LIMITED, 404, 1112 West Pender Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Chalcopyrite and pyrite mineralization occurs in Vancouver Group volcanic rocks. Assays were low from three diamond-drill holes in the three best zones.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; geochemical soil survey, approximately 300 samples; road construction, one-half mile (for drill site access); stripping, 300 feet; surface diamond drilling, three holes totalling 908 feet.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 235.

VENT (No. 14, Fig. C)

LOCATION: Lat. 49° 14.5' Long. 125° 20.5' (92F/3W)
ALBERNI M.D. At approximately 2,000 feet elevation on the east side of Kennedy River, 9 miles northeast of Kennedy Lake. Highway 4 borders the claims on the west.

CLAIMS: VENT 10, 12 to 18, 28 to 33, 42 to 50, 52 to 61, VENT 1, 2, 22, 62, and 63 Fractions.

ACCESS: By Highway 4 and then by logging road for a distance of 1 mile.

OPERATOR: DeKALB MINING CORPORATION, 635 Sixth Avenue SW., Calgary, Alta.

METALS: Copper, molybdenum.

DESCRIPTION: An intrusive plug ranging from diorite to quartz diorite composition intrudes Karmutsen volcanic rocks. Extensive fracturing occurs in the contact zone. Pyrite and some chalcopyrite are found in the fractures and a smaller amount is disseminated in the intrusive rock.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; road construction, 1 mile on Vent 28, 30, and 31; surface diamond drilling, three holes totalling 3,000 feet on Vent 28, 30, and 31.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 235.

FOREMOST (No. 18, Fig. C)

LOCATION: Lat. 49° 14.5′ Long. 125° 35′ (92F/4E, 5E)
ALBERNI M.D. At approximately 800 feet elevation along the west side of and at the head of Tofino Inlet.

CLAIMS: FOREMOST, FOREMOST COPPER, CLEAR CREEK, COPPER CREEK, CANYON, VELVET, NICKEL, SW, etc., totalling 51.

ACCESS: By boat from Tofino, 18 miles.

OWNER: SUN-WEST MINERALS, LIMITED, 803, 1636 Haro Street, Vancouver 5.

METALS: Copper, nickel, molybdenum, iron.

WORK DONE: Trenching on Copper Creek 1 and stripping on Clear Creek 1 and 3.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1963, pp. 111, 112; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, pp. 217, 218.

LONE CONE, IRON CAP (No. 96, Fig. C)

LOCATION: Lat. 49° 11′-14.5′ Long. 125° 52′-56′ (92F/4W)
ALBERNI M.D. The property covers most of the western peninsula of Meares Island and lies from 2 to 6 miles north of Tofino.

CLAIMS: LONE CONE 1 to 39, 42 to 44, 52 to 59, 60 to 69, BL 1 to 24, 90 to 98, LITE 1 to 3, NICKEL, NICKEL 1 to 6, WIN 1 to 6.

ACCESS: By boat from Tofino, 5 miles.

OWNER: TEXADA MINES LTD., 407, 1111 West Georgia Street, Vancouver 5.

METALS: Copper, nickel, molybdenum.

DESCRIPTION: Two types of deposits are reported. Chalcopyrite and pentlandite are associated with pyrrhotite as disseminations and massive replacement in gabbro. Chalcopyrite and molybdenite occur in quartz diorite and in adjacent gabbro and andesite.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; magnetometer survey, 12 line-miles covering Lone Cone 1-6, 8-12, 14, 17-22, Win 1-6, BL 1-10, 13, 15; geochemical soil and silt survey, 697 samples covering all claims; trenching, 100 cubic feet on Lone Cone 12, 17, and 20; stripping, 400 cubic yards on Lone Cone 9.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1898, p. 1133; 1965, p. 235; Assessment Reports 739, 4175.

ISLAND (No. 97, Fig. C)

LOCATION: Lat. 49° 14.7′ Long. 125° 54.5′ (92F/4W)
ALBERNI M.D. On Saranac Island, 6 miles north of Tofino.

CLAIMS: ISLAND 1 and 2.

ACCESS: By boat from Tofino, 6 miles.

OWNER: TEXADA MINES LTD., 407, 1111 West Georgia Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: Pyrrhotite and chalcopyrite mineralization occurs in gabbro.

WORK DONE: Trail constructed, 1,700 feet (across island in northwesterly direction); trenching, 261 cubic feet.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 217 (Cat, Cyprus).

CATFACE (No. 19, Fig. C)

LOCATION: Lat. 49° 16′ Long. 125° 59′ (92F/4W, 5W; 92E/8E)
ALBERNI M.D. From 1,600 to 3,000 feet elevation in the Catface Range between Bedwell Sound and Herbert Inlet, 8 miles north-northwest of Tofino.
CLAIMS: CATFACE, totalling 145.
ACCESS: By boat and road from Tofino, 11 miles.
OWNER: Catface Copper Mines Limited.
OPERATOR: FALCONBRIDGE NICKEL MINES LIMITED, 500, 1112 West Pender Street, Vancouver 1.
METALS: Copper, molybdenum.
DESCRIPTION: Chalcopyrite, bornite, and molybdenite mineralization occurs in quartz monzonite, quartz diorite, and volcanic host rocks. Alteration consists of silicification and chloritization.
WORK DONE: Surface geological mapping, 1 inch equals 200 feet.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 236.

CYPRESS (No. 98, Fig. C)

LOCATION: Lat. 49° 16′ Long. 125° 55′ (92F/5W)
ALBERNI M.D. Between sea-level and 1,500 feet elevation on Cypress Bay, 7.5 miles north of Tofino.
CLAIMS: CYPRESS 1 to 10, 12 to 15, TOP 1 to 14.
ACCESS: By boat from Tofino, 8 miles.
OWNER: TEXADA MINES LTD., 407, 1111 West Georgia Street, Vancouver 5.
METAL: Copper.
DESCRIPTION: Mineralization consists of chalcopyrite in quartz veins cutting greenstone and argillite.
WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet covering Cypress claims; geochemical soil and silt survey covering Cypress claims and Top 1-8; line-cutting, 18,100 feet on Cypress 7, 8 and Top 1, 2, 4.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 217 (Cyprus); Assessment Report 4177.

CATS EYE (No. 99, Fig. C)

LOCATION: Lat. 49° 16.5′-18.5′ Long. 125° 53.5′-56.5′ (92F/5W)
ALBERNI M.D. At approximately 100 feet elevation along Cypre River, near its mouth, 9 miles north of Tofino.
CLAIMS: CATS EYE 3 to 20, 23. HOT 1 to 14, MONICA 1 to 10.
ACCESS: By boat or floatplane from Tofino, 8 miles.
OWNER: THUNDER VALLEY MINES LTD., 3, 22374 Lougheed Highway, Maple Ridge.
METALS: Copper, silver.
DESCRIPTION: The claims are underlain by andesite and andesite tuff interbedded with limestone and intruded by gabbro and diorite. Chalcopyrite is associated with quartz in fractures.

WORK DONE: Surface diamond drilling, three holes totalling 1,449 feet on Hot 1 and 2.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 246.

BAY CREEK (No. 100, Fig. C)

LOCATION: Lat. 49° 17' Long. 125° 53.5' (92F/5W)
ALBERNI M.D. Between sea-level and 100 feet elevation on the north shore of Cypress Bay, 9 miles north of Tofino.
CLAIMS: BAY CREEK 1 to 8.
ACCESS: By boat from Tofino, 9 miles.
OWNER: TEXADA MINES LTD., 407, 1111 West Georgia Street, Vancouver 5.
METAL: Copper.
DESCRIPTION: Mineralization consists of scattered zones of pyrrhotite with chalcopyrite in a siliceous host rock.
WORK DONE: Trenching, 776 cubic feet on Bay 1-4.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 217 (Cat, Cyprus).

CUB (No. 130, Fig. C)

LOCATION: Lat. 49° 26' Long. 125° 44' (92F/5E)
ALBERNI M.D. On Dry Creek, on the northwest side of Bedwell River, 3 miles above Ursus Creek.
CLAIMS: CUB 1 to 12, NUB 1 and 2.
ACCESS: By boat to Bedwell, thence by an improved logging road up Bedwell River.
OPERATOR: WALTER GUPPY, Box 94, Tofino.
METALS: Copper, molybdenum.
WORK DONE: Geological and geochemical surveys.
REFERENCE: Assessment Report 4101.

CREAM, BEAR (No. 24, Fig. C)

LOCATION: Lat. 49° 28'-33' Long. 125° 30'-34.5' (92F/5E, 12E)
ALBERNI M.D. From 1 to 5 miles south of Buttle Lake at an elevation of 3,000 feet.
CLAIMS: CREAM, BEAR, STAN, CROSS, PRICE, ELK, X, D, H, totalling 180.
ACCESS: By helicopter from the Lynx mine, 6 miles.
OWNER: Cream Silver Mines Ltd.
OPERATOR: WESTERN MINES LIMITED, 870, One Bentall Centre, 505 Burrard Street, Vancouver 1.
METALS: Copper, lead, zinc, gold, silver.
DESCRIPTION: Variegated siliceous volcanic pyroclastic and flow rocks are crosscut by Jurassic porphyritic microgranodiorite dykes.
WORK DONE: Surface geological mapping, 1 inch equals 500 feet and 1 inch equals 1,000 feet covering most of the claims; surface diamond drilling, two

holes totalling 1,597 feet on X 1.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, pp. 245, 246; Assessment Reports 3910, 3911, 3912.

B, DEDE, EM (No. 16, Fig. C)

LOCATION: Lat. 49° 16.5'-18' Long. 125° 02'-06.5' (92F/6E)
ALBERNI M.D. At the middle of the north side of Sproat Lake.

CLAIMS: B 1 to 20, DEDE 1 to 12, EM 1 to 6.

ACCESS: By road from Alberni, 16 miles.

OWNER: McLEOD COPPER LTD., 6849 McPherson, Burnaby.

DESCRIPTION: Volcanic rocks of the Vancouver Group are intruded by granitic rocks.

WORK DONE: Geochemical survey, 200 samples covering some of the B claims; surface diamond drilling on B 1, 2, 9 and EM 3, 5; drilling and blasting on Dede 1, 3, 5, 6, 12.

HERB, MOON (No. 17, Fig. C)

LOCATION: Lat. 49° 17.3' Long. 125° 11.2' (92F/6E)
ALBERNI M.D. On the north side of Sproat Lake, at its western end.

CLAIMS: HERB 1 to 49, MOON 1 to 23, FTJ 1 to 8.

ACCESS: By road from Alberni, 21 miles.

OWNER: McLEOD COPPER LTD., 6849 McPherson, Burnaby.

METAL: Copper.

DESCRIPTION: The area is underlain by Karmutsen volcanic rocks intruded by Island Intrusions. Thin bands of argillite, calcareous argillite, and limestone also occur on the property. The volcanic and sedimentary rocks are cut by porphyry and andesite dykes. Mineralization consists of disseminated chalcopyrite, pyrite, and minor bornite in volcanic rocks and is reported to be locally more abundant in argillite zones. Chalcopyrite and pyrite also occur in fractures forming thin veins and as disseminations in association with sills and dykes.

WORK DONE: Surface geological mapping covering Moon 1-23 and Herb 1-6, 15, 16; Geochemical soil survey, 690 samples covering same claims; surface diamond drilling, 32 holes totalling 800 feet on Herb 1-4, 9, 16, Moon 2, 9, 13, and FTJ 2, 5.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 247; Assessment Reports 2417, 3957.

HM (No. 129, Fig. C)

LOCATION: Lat. 49° 18.3'-19.3' Long. 125° 03'-07.5' (92F/6E)
ALBERNI M.D. Between Great Central and Sproat Lakes, 15 miles west-northwest of Port Alberni.

CLAIMS: HM 1 to 65.

(92F/6E, 7W)

OWNER: **GREAT CENTRAL MINES LTD.**, 3370 Coastmeridian Road, Port Coquitlam.

METALS: Copper, nickel.

WORK DONE: Geochemical soil survey, 40 samples and trenching, 100 feet covering HM 19-24.

REFERENCE: Assessment Report 3651.

R (No. 15, Fig. C)

LOCATION: Lat. 49° 17.5' Long. 125° 00.5' (92F/6E, 7W)
ALBERNI M.D. Between 125 and 1,100 feet elevation 1 mile north of Sproat Lake, 10 miles west-northwest of Port Alberni.

CLAIMS: R 1 to 18.

ACCESS: By road from Port Alberni, 10 miles.

OWNER: RIVERWOOD RESOURCES LIMITED (formerly Progress Mines Ltd.), 101, 235 Howe Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The claim group is underlain by Upper Triassic volcanic rocks intruded by granitic rocks. Sulphide mineralization carrying minor copper values occurs in the altered, brecciated, andesite-granodiortie contact zone.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; geochemical soil survey, 140 samples.

TEXADA MINE (No. 132, Fig. C)

By W. C. Robinson

LOCATION: Lat. 49° 43' Long. 124° 34' (92F/10E)
NANAIMO M.D. The mine is at Welcome Bay on the southwest coast of Texada Island.

ACCESS: Eight miles by road from Vananda.

OWNER: TEXADA MINES LTD., Box 10, Gillies Bay.

METALS: Iron, copper (production shown on Table I).

DESCRIPTION: The Lake and Paxton orebodies containing magnetite with minor amounts of chalcopyrite and pyrrhotite replace limestones, basalts, and minor amounts of quartz diorite at the keels of compressed overturned synclines plunging gently westward and sharply overturned toward the northeast. The western orebodies (Prescott, Midway, and Yellow Kid), with similar mineralization, form an upwardly branching system following the contact zone between the Gillies granodiorite to quartz diorite stock and the Texada volcanic rocks. The presence of irregular porphyry bodies and breccia appear to have had an important influence on ore deposition.

WORK DONE: During 1972 trackless-mining methods completed 4,607 feet of drifting. Other work included 198 feet of subdrifting, 1,273 feet of raising, and 3,884 feet of underground diamond drilling. The major portion of the ore was mined by long-hole stoping. In the mill magnetic separation and selective flotation methods were used to produce an iron and copper concentrate.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1964, pp. 146-151; 1966, p. 72; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 282; 1971, p. 251.

PRICE **(No. 26, Fig. C)**

LOCATION: Lat. 49° 33.5' Long. 125° 34.2' (92F/12E)
ALBERNI M.D. At approximately 1,300 feet elevation one-half mile west of the south end of Buttle Lake.

CLAIMS: BOULDER, RAVEN, BETTY, BARITE (Lots 1971 to 1974) and approximately 45 W and HAT located claims.

ACCESS: By road from Campbell River, 55 miles.

OWNER: WESTERN MINES LIMITED, 870, One Bentall Centre, 505 Burrard Street, Vancouver 1.

METALS: Copper, lead, zinc, gold, silver.

DESCRIPTION: Irregular-shaped massive orebodies in altered siliceous Sicker volcanic rocks commonly occur in close proximity to unaltered andesitic flows.

WORK DONE: Surface geological mapping, 1 inch equals 500 feet; surface diamond drilling, two holes totalling 666 feet.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 251.

MYRA MINE **(No. 25, Fig. C)**

LOCATION: Lat. 49° 34.3' Long. 125° 35.3' (92F/12E)
ALBERNI M.D. On the south side of Myra Creek, 1 mile west of the south end of Buttle Lake, on the south slope of Myra Creek valley.

CLAIMS: BEAR PAW, BEAVER PAW, RIGHT PAW, LEFT PAW (Lots 1344 to 1347), SOUTH PAW, WEST PAW, NORTH PAW, EAST PAW (Lots 1668 to 1671) and approximately 60 located claims including W, ELK, and HAT.

ACCESS: By road from Campbell River, 55 miles.

OWNER: WESTERN MINES LIMITED, 870, One Bentall Centre, 505 Burrard Street, Vancouver 1.

METALS: Copper, lead, zinc, gold, silver, cadmium (production shown in Table).

(92F/12E)

DESCRIPTION: Sheared Sicker siliceous pyroclastic rocks contain irregular lens-shaped massive sulphide orebodies.

WORK DONE: Surface geological mapping, 1 inch equals 500 feet; underground geological mapping, 1 inch equals 20 feet; drifting and crosscutting, 7,895 feet; raising, 2,186 feet; diamond drilling, 48,560 feet. A backfill storage and batching plant was errected at the No. 10 level portal. Ore was trucked to the nearby concentrator at the Lynx mine, with milling commencing during October 1972.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 251.

LYNX MINE (No. 136, Fig. C)

By W. C. Robinson

LOCATION: Lat. 49° 34.5′ Long. 125° 35.5′ (92F/12E)
ALBERNI M.D. The mine is on Myra Creek, 1 mile west of the south end of Buttle Lake.

CLAIMS: Fifteen Crown-granted and 40 located claims.

ACCESS: By road from Campbell River, 55 miles.

OWNER: WESTERN MINES LIMITED, 870, One Bentall Centre, 505 Burrard Street, Vancouver 1; mine office, Myra Creek.

METALS: Copper, zinc, lead, silver, gold, cadmium (production shown on Table I).

DESCRIPTION: Massive sulphide orebodies contain mainly chalcopyrite, galena, sphalerite, and pyrite in a gangue of quartz sericite schist, calcite, and barite within a shear zone developed in andesite flows, volcanic breccias, and in massive and thin-bedded tuffs.

WORK DONE: Drifting and crosscutting, 6,023 feet; raising, 4,449 feet; diamond drilling, 53,121 feet. During 1972 approximately half of the ore was obtained from the open pit and half from underground. Most of the underground ore was mined by cut-and-fill method, with mill tailings being used for backfill. The diesel powerhouse was enlarged to accommodate two additional diesel generators. Other construction included the completion of a new tailings pipeline between the sandfill plant and Buttle Lake and the erection of a new oil storage tank. During October an addition to the concentrator, to treat ore from the Myra mine, was completed.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1964, pp. 157-166; *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 252.

VANHALL, DV (No. 127, Fig. C)

LOCATION: Lat. 49° 55′ Long. 126° 00′ (92E/16E; 92F/13W)
Report on this property in section 92E/16E.

MOORE (No. 27, Fig. C)

LOCATION: Lat. 49° 51.5' Long. 125° 34' (92F/13E)
NANAIMO M.D. At elevations of 1,400 to 2,300 feet on the southeast shore of Upper Quinsam Lake between Hawkins and Sihun Creeks, 24 miles west of Campbell River.

CLAIMS: MOORE 1 to 5, PEEVER 1 to 5.

ACCESS: By the Campbell River-Gold River Highway and secondary logging roads to Upper Quinsam Lake.

OWNER: PANTHER MINES LTD., 333, 885 Dunsmuir Street, Vancouver 1.

METALS: Copper, iron.

DESCRIPTION: Chalcopyrite occurs in amygdules and minor amounts are disseminated with magnetite in basalt.

WORK DONE: Geological mapping and geochemical survey, 181 samples during 1971.

REFERENCE: Assessment Report 3445.

OK (No. 58, Fig. C)

LOCATION: Lat. 49° 59' - 50' 04.5' Long. 124° 35'-43' (92K/2E; 92F/15E)
Report on this property in section 92K/2E.

HI, MARS (No. 59, Fig. C)

LOCATION: Lat. 49° 55'-57.5' Long. 124° 20.5'-22.5' (92F/16W)
VANCOUVER M.D. The property is centred 1 mile southwest of Lewis Lake at an elevation of 1,500 feet, approximately 10 miles northeast of Powell River.

CLAIMS: HI 1 to 8, MARS 1 to 8, WOF 1 to 6, BULL 1 to 12, DEE 1 to 4, BECUS 1 to 4.

OWNER: PHELPS DODGE CORPORATION OF CANADA, LIMITED, 404, 1112 West Pender Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Mafic-rich granodiorite and quartz diorite are intruded by a small plug and dyke complex striking north-south with vertical dip. Mafic minerals are replaced locally by sulphides. Chalcopyrite is reported to occur as disseminations and fracture fillings in silicified zones in granodiorite and quartz diorite.

(92F/16W)

WORK DONE: Surface geological mapping, 1 inch equals 100 feet covering Hi 1-8 and parts of Mars 1-8 and Bull 1-6; induced polarization survey, 7.05 line-miles covering same claims; road construction, three-quarters of a mile on Becus 1-4. During 1971 The Hanna Mining Company did the following work: reconnaissance geological mapping; detailed geological mapping covering Dee 1, 2 and Bee 7, 8; geochemical soil surveys covering Mars and Hi claims.

REFERENCES: Assessment Reports 3489, 3549, 3550.

TT, JT, Y (No. 133, Fig. C)

LOCATION: Lat. 49° 53'-54.5' Long. 124° 18'-23' (92F/16W)
VANCOUVER M.D. Between 500 and 1,400 feet elevation south and west of Nanton Lake, 10 miles east-northeast of Powell River.

CLAIMS: TT 1 to 32, JT 9 to 16, Y 1 to 16.

ACCESS: Fifteen miles south on Highway 101 from Powell River and then 13 miles north on the Weldwood Logging road.

OWNER: NEWVAN RESOURCES LTD., 211, 850 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: Fractures in Coast Plutonic Complex contain chalcopyrite, bornite, pyrite, pyrrhotite, and molybdenite.

WORK DONE: Geochemical soil survey, 440 samples covering TT 1 to 32; surface diamond drilling, two holes totalling 150 feet on TT 1 and 2.

VANCOUVER 92G

APRIL (No. 69, Fig. C)

LOCATION: Lat. 49° 26' Long. 122° 35' (92G/7E)
NEW WESTMINSTER M.D. On the west shore of Pitt Lake, 5 miles from the south end of the lake.

CLAIMS: APRIL, MAY, JUNE, MILLIE.

ACCESS: By floatplane from Vancouver, 30 miles.

OPERATOR: YUKON GOLD PLACERS, LIMITED, 4th Floor, Two Bentall Centre, 555 Burrard Street, Vancouver 1.

METALS: Gold, nickel, copper.

DESCRIPTION: Minor nickel and copper mineralization occurs in pyroxenite.

WORK DONE: Geological mapping, 1 inch equals 100 feet; magnetometer survey.

REFERENCE: Assessment Report 3907.

HARRISON, LUCKY JIM (No. 140, Fig. B)

LOCATION: Lat. 49° 19′ Long. 121° 56.5′ (92H/5W; 92G/8E)
Report on this property in section 92H/5W.

RAT (No. 70, Fig. C)

LOCATION: Lat. 49° 22.2′-24.2′ Long. 122° 00′-02.5′ (92G/8E)
NEW WESTMINSTER M.D. At elevations of 800 to 2,500 feet at the south end of Chehalis Lake, 20 miles northeast of Mission City.
CLAIMS: RAT 1 to 14, 21 to 40, 45 to 50.
ACCESS: By Highway 7 and logging roads.
OWNER: LAURA MINES LTD., 403, 717 West Pender Street, Vancouver 1.
DESCRIPTION: The claims are underlain by Middle Jurassic volcanic rocks of the Harrison Lake Formation.
WORK DONE: Geochemical survey, 15 rock samples and 380 soil samples; geological mapping.
REFERENCE: Assessment Report 3664.

HE (No. 97, Fig. B)

LOCATION: Lat. 49° 26′-28′ Long. 121° 58′ - 122° 01′ (92H/5W; 92G/8E)
Report on this property in section 92H/5W.

KF (No. 71, Fig. C)

LOCATION: Lat. 49° 35′ Long. 122° 05′ (92G/9E)
NEW WESTMINSTER M.D. Between 5,000 and 6,000 feet elevation 11 miles northeast of the north end of Stave Lake.
CLAIMS: KF 1 to 30.
ACCESS: By logging road from the north end of Stave Lake thence by helicopter 2 miles northeast.
OPERATOR: JASON EXPLORERS LTD., 775, 555 Burrard Street, Vancouver 1.
METALS: Copper, molybdenum.
DESCRIPTION: Parallel fracture zones in granitic rocks contain bornite, chalcopyrite, and molybdenite.
WORK DONE: Surface geological mapping, 1 inch equals 200 feet; trenching, 450 feet on KF 1 and 3.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 246.

BOR (No. 68, Fig. C)

LOCATION: Lat. 49° 39.3′ Long. 122° 37′ (92G/10E)
NEW WESTMINSTER M.D. On Corbold Creek at 2,500 feet elevation, 8 miles north of the head of Pitt Lake.
CLAIMS: BOR 1 to 24.

ACCESS:	By helicopter from Pitt Lake, 30 miles.
OWNER:	DUNBAR RESOURCES LTD., 200, 1405 Hunter Street, North Vancouver.
METALS:	Copper, silver.
DESCRIPTION:	The property is underlain by a roof pendant of altered volcanic rock in contact with and enclosed by hybrid plutonic rocks ranging from diorite to granodiorite. Alteration of the pendant and plutonic rocks is pervasive and consists of chloritization, epidotization, albitization, and pyritization. The bedrock complex is highly fractured and is cut by a series of lamprophyre dykes.
WORK DONE:	Geochemical stream silt survey covering Bor 1 to 24.
REFERENCE:	Assessment Report 3906.

LORI (No. 67, Fig. C)

LOCATION:	Lat. 49° 42.5' Long. 122° 56' (92G/10W) VANCOUVER M.D. At an elevation of 3,000 feet on the north side of Mamquam River, 10 miles east of Squamish.
CLAIMS:	LORI 1 to 18, S 1 to 12, SEE 1, 2, 11 to 17, L 1, 2, 7 to 18.
ACCESS:	By road from Squamish, 11 miles.
OWNER:	EXETER MINES LIMITED, 211, 850 West Hastings Street, Vancouver 1.
METALS:	Copper, molybdenum.
DESCRIPTION:	Sulphide mineralization, consisting of pyrite, chalcopyrite, and molybdenite in fractures and quartz veinlets, is present in diorite and quartz diorite Coast Intrusions.
WORK DONE:	Line-cutting; geochemical soil survey, 1,273 samples.
REFERENCES:	*B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 255; Assessment Reports 3793, 4467.

BRITANNIA MINE (No. 145, Fig. C)

By J. W. Robinson

LOCATION:	Lat. 49° 36.6' Long. 123° 08.5' (92G/11E) VANCOUVER M.D. The Britannia mine is on the east side of Howe Sound, 40 miles by road north of Vancouver.
ACCESS:	North from Vancouver by road, 40 miles.
OWNER:	ANACONDA CANADA LIMITED, ANACONDA BRITANNIA MINES DIVISION, Britannia Beach.
METAL:	Copper, zinc (production shown on Table I).
DESCRIPTION:	The Britannia mine is a massive sulphide deposit in which the main ore appears to be in a siliceous vein and replacement stockwork. The orebodies are situated in a schistose zone transecting a pendant of Cretaceous andesitic and dacitic pyroclastic rocks that are overlain by argillites and cut by related dykes.

WORK DONE:

During 1972, development work in the Britannia mine consisted of 1,519 feet of track drifting and crosscutting. There were 7,700 feet of trackless drifts and crosscuts driven and 2,044 feet of trackless ramps. The Alimak raise machine was used to drive 414 feet of raise. There were 2,261 feet of raises driven using staging. Slusher subdrifts were advanced for 439 feet.

Preparatory development work was started for the No. 11 winze project, which will give access to the ore below the present bottom of No. 10 shaft. Plans for 1973 are to complete the portion from 5500 level to 5900 level. The method of mining in the No. 10 shaft mine was changed from a vertical ring blasthole stoping system to a modified sublevel caving method.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 193; 1970, pp. 233-246; 1971, p. 255.

NAB (No. 65, Fig. C)

LOCATION: Lat. 49° 38' Long. 123° 25' (92G/11W)
VANCOUVER M.D. At approximately 1,500 feet elevation on McNab Creek, 5 miles from Howe Sound.
CLAIMS: NAB 1 to 24.
ACCESS: By road from McNab Creek logging camp, 6 miles or from Vancouver by helicopter, 25 miles.
OWNER: AMOCO CANADA PETROLEUM CO. LTD., 2160, 1055 West Hastings Street, Vancouver 1.
METALS: Copper, molybdenum.
DESCRIPTION: Chalcopyrite and molybdenite occur in quartz veins in fresh quartz diorite.
WORK DONE: Surface geological mapping, 1 inch equals 200 feet covering Nab 1-8; geochemical soil, silt, rock, and water survey, 230 samples covering same claims.

COPPER BAY (No. 66, Fig. C)

LOCATION: Lat. 49° 30.5' Long. 123° 20.8' (92G/11W)
VANCOUVER M.D. On the north and east coast of Gambier Island, on Ramillies Channel, 20 miles northwest of Vancouver.
CLAIMS: COPPER BAY, BLUE GROUSE, BALD EAGLE, SHARCKS BAY, N & J, ANVEL, JD, JON, DALE, etc., totalling approximately 63.
ACCESS: By boat from Vancouver.
OWNER: GAYLORD MINES LIMITED, 306, 736 Granville Street, Vancouver 2.
METAL: Copper.
DESCRIPTION: Copper sulphides occur in volcanic rocks near diorite on the Copper Bay claim.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 254; Assessment Report 3724, 3908.

HOWE COPPER (ZEL) (No. 102, Fig. C)

LOCATION: Lat. 49° 42.5' Long. 123° 27.2' (92G/11W)
VANCOUVER M.D. On Mount Donaldson, 13 miles west of Squamish.

CLAIMS: KAREN 1 to 16.

ACCESS: By helicopter, 35 miles from Vancouver.

OWNER: ATHENA MINES LTD., 315, 543 Granville Street, Vancouver 2.

METALS: Copper, molybdenum, silver.

DESCRIPTION: Parallel quartz veins containing bornite, chalcopyrite, cuprite, and molybdenite mineralization with some silver values occur in granite in the vicinity of the claims.

WORK DONE: Reconnaissance surface geological mapping covering Karen 9-12; airborne magnetometer and electromagnetic survey covering Karen 1-16; two trenches on Karen 12; trail constructed.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1928, p. 389 (Pacific Copper Mines Ltd.); 1967, p. 62 (Zel); Assessment Reports 752, 4003.

SN (No. 64, Fig. C)

LOCATION: Lat. 49° 37.3' Long. 123° 51' (92G/12W)
VANCOUVER M.D. At approximately 500 feet elevation on the west side of Sechelt Inlet, 11 miles north-northwest of Sechelt.

CLAIMS: SN 1 to 26, SN Fraction.

ACCESS: By boat from Sechelt, 12 miles.

OWNER: KITIMAT COPPER CO. LTD., 6660 Dunnedin Street, Burnaby 2.

WORK DONE: Geochemical soil survey, 40 samples covering three claims.

WAR, REN (No. 63, Fig. C)

LOCATION: Lat. 49° 38.5' Long. 123° 53.8' (92G/12W)
VANCOUVER M.D. At 3,400 feet elevation on Lyon Lake on the Sechelt Peninsula, 45 miles northwest of Vancouver.

CLAIMS: WAR 1 to 68, 71 to 74, REN 1 to 12, FRAC 3 to 5 Fractions.

ACCESS: By road from Gibsons, 26 miles.

OWNER: Branta Explorations Ltd.

OPERATOR: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

METALS: Molybdenum, copper.

DESCRIPTION: Metasedimentary and metavolcanic rocks and altered diorite are intruded by two later phases of intrusive rocks. Molybdenite and chalcopyrite occur as disseminations and in fractures in altered diorite.

WORK DONE: Surface geological mapping, 1 inch equals 2,000 feet and geochemical soil survey, 124 samples covering all claims. During 1971 Branta Explorations Ltd. did geological mapping at a scale of 1 inch equals 1,300 feet and 7 miles of line-cutting.

REFERENCES: Assessment Reports 3532, 3909.

EDDY, DAY (No. 62, Fig. C)

LOCATION: Lat. 49° 41′ Long. 123° 57′ (92G/12W)
VANCOUVER M.D. On the northern end of the Sechelt Peninsula, 17 miles north-northwest of Sechelt.
CLAIMS: EDDY 1 to 8, DAY 7, 8, 8, 9, BEV 1 to 4, JOHN 1 to 12, MH 1 to 10 (in part an overstaking of the CAMBRIAN CHIEFTAIN property).
ACCESS: By road from the Langdale Ferry terminal, 45 miles.
OWNER: CONE MT. MINES LTD., 8167 Main Street, Vancouver 15.
METALS: Copper, zinc, molybdenum.
DESCRIPTTION: Minor pyrite, chalcopyrite, sphalerite, and molybdenite occur in a fault zone in diorite on the Day claims.
WORK DONE: Line-cutting and geochemical soil survey, 450 samples.
REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1953, p. 162; 1961, p. 89; *B.C. Dept. of Mines,* Bull. 39, p. 37; Assessment Reports 3757, 3946.

FANG (No. 60, Fig. C)

LOCATION: Lat. 49° 53.2′ Long. 123° 51.2′ (92G/13W)
VANCOUVER M.D. On Jervis Inlet, Prince of Wales Reach, 7 miles north of Egmont and 1 mile south of Vancouver Bay.
CLAIMS: FANG 1 to 14, EGG 1 and 2.
ACCESS: By boat or floatplane from Egmont, 7 miles north.
OWNER: THUNDER VALLEY MINES LTD., 315, 543 Granville Street, Vancouver 2.
METAL: Copper.
WORK DONE: Magnetometer and electromagnetic surveys.
REFERENCE: Assessment Report 3613.

COPPER (No. 61, Fig. C)

LOCATION: Lat. 49° 48.5′-51.5′ Long. 123° 50′-52′ (92G/13W)
VANCOUVER M.D. Between sea-level and 3,500 feet elevation on the east shore of Jervis Inlet near the mouth of Treat Creek.
CLAIMS: T 1 to 67 (in part a restaking of the old BONANZA, ELDORADO, COLORADO, PORTLAND, COLUMBIA, BEAVER, COON, and OTTER claims).
ACCESS: By floatplane from Vancouver, 60 miles or by boat from Egmont, 8 miles.
OWNER: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Andesitic and dacitic tuff, basalt, argillite, chert, and skarn zones comprise a roof pendant within the Coast Plutonic Complex. The volcanic rocks are said to be mineralized by disseminated pyrrhotite, pyrite, and magnetite with minor chalcopyrite and sphalerite.
WORK DONE: Surface geological mapping, 1 inch equals 200 feet covering 16 claims;

magnetometer and electromagnetic surveys, covering 18 claims; geochemical soil survey covering 18 claims; surface diamond drilling, five holes totalling 206 feet on T 3 and 7 and one hole totalling 1,019 feet on T 1 and 5.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1922, pp. 249, 250; *B.C. Dept. of Mines,* Bull. 39, p. 37.

VENETIAN (NANI) (No. 103, Fig. C)

LOCATION: Lat. 49° 59' - 50° 01.5' Long. 123° 06' (92G/14E; 92J/3E) VANCOUVER M.D. At approximately 2,500 feet elevation on the east side of Daisy Lake, 20 miles north of Squamish.

CLAIMS: DAISY 1 to 6, FF 1 to 14. (The DAISY claims cover the old VENETIAN or NANI prospect.)

ACCESS: By four-wheel-drive vehicle road and trail from Daisy Lake, 2 miles.

OWNER: ACACIA MINERAL DEVELOPMENT CORPORATION LTD., 201, 535 Howe Street, Vancouver 1.

METALS: Copper, silver, gold.

DESCRIPTION: Sandstone, slate, and limestone are cut by an irregular quartz vein. The vein varies from a few inches to 15 feet in width and is mineralized with pyrite and chalcopyrite. Gold and silver have been reported.

WORK DONE: Road construction, 3 miles on FF claims; trenching and stripping.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1916, p. 372 (Saule Medici); 1936, p. F61 (reference to special report on Nani group); *Geol. Surv., Canada,* Sum. Rept., 1917, Pt. B, p. 21 (Venetian).

PEMBERTON 92J

RM (No. 150, Fig. C)

LOCATION: Lat. 50° 09.6' Long. 122° 57.8' (92J/2W) LILLOOET M.D. On the northwest side of Green Lake, 4 miles north-northeast of Alta Lake station.

CLAIMS: RM 9 to 56.

ACCESS: Highway 99 passes through the southern part of the property.

OWNER: BATTLECREEK MINES LTD., 407, 717 West Pender Street, Vancouver 1.

METAL: Copper.

WORK DONE: Geological survey; geochemical survey, 6.2 line-miles; electromagnetic survey, 9.7 line-miles.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 306; Assessment Report 3947.

IRON KING (COUGAR) (No. 148, Fig. C)

LOCATION: Lat. 50° 08.2′ Long. 122° 58.8′ (92J/2W)
VANCOUVER M.D. Between 2,400 and 2,700 feet elevation 1 mile north of Alta Lake.

CLAIMS: Mineral Lease M-53 comprising IRON KING, MORNING STAR, SUMMIT, VULCAN, EMPRESS, COUGAR, IRON KING NO. 2, and VULCAN NO. 2 (Lots 3402 to 3404, 3406 to 3408, 3410, and 3411).

ACCESS: By trail from the Pemberton-Squamish Highway, one-quarter mile.

OWNER: NEW JERSEY ZINC EXPLORATION COMPANY (CANADA) LTD., 905, 525 Seymour Street, Vancouver 2.

METAL: Iron.

DESCRIPTION: A roof pendant of schistose volcanic rocks within the Coast Intrusions contains abundant pyrite in a tabular zone controlled by schistosity. Three deposits of limonite were mined from 1918 to the 1940's.

WORK DONE: Surface diamond drilling, two holes totalling 203 feet on Vulcan (Lot 3406).

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1918, p. 294 (Cougar); 1947, pp. 214, 215.

VENETIAN (NANI) (No. 103, Fig. C)

LOCATION: Lat. 49° 59′ - 50° 01.5′ Long. 123° 06′ (92G/14E; 92J/3E)
Report on this property in section 92G/14E.

WARMAN (No. 149, Fig. C)

LOCATION: Lat. 50° 07.7′ Long. 123° 06.2′ (92J/3E)
VANCOUVER M.D. At approximately 3,900 feet elevation on the east side of Callaghan Creek, 5 miles west of Alta Lake.

CLAIMS: WARMAN 1 to 18, DOG 1 to 15, 28 to 31, 46, 47, 50, 52 to 55, 63 to 66; CAT 1 to 10, 19 to 32, 35 to 38, CAT 1 to 5 Fractions, BERT 1 to 4 Fractions, LORI 13 to 24, 37 to 48.

ACCESS: By logging road from Highway 99, approximately 9 miles.

OPERATORS: McINTYRE PORCUPINE MINES LIMITED, 1003, 409 Granville Street, Vancouver 2 and NORTHAIR MINES LTD., 333, 885 Dunsmuir Street, Vancouver 1.

METALS: Gold, copper, silver, lead, zinc.

DESCRIPTION: Quartz carbonate veins in andesite contain galena, sphalerite, and chalcopyrite.

WORK DONE: McIntyre Porcupine Mines Limited – topography mapped; surface geological mapping, 1 inch equals 1,000 feet; geochemical soil survey, 1,500 samples; trenching, 300 feet; Northair Mines Ltd. – trenches and drill holes mapped; geochemical soil survey, 2,000 samples; road construction, 2 miles (tote road from end of logging road); trenching 425 cubic feet on Warman 15 and 16; stripping, 10,200 square feet on Warman 15 and 16; surface diamond drilling, 28 holes totalling 5,000 feet on Warman 15 and 16.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 306; Assessment Report 4153.

COPPER QUEEN (No. 72, Fig. C)

LOCATION: Lat. 50° 23'-27' Long. 122° 44'-51' (92J/7)
LILLOOET M.D. Between 2,500 and 3,700 feet elevation along Owl Creek, 6 miles north of Pemberton.

CLAIMS: OWL 1 to 8, OC 1 to 6, 43 to 48, KB 1 to 14, OLN 1 to 24, BO 1 to 12, OL 1 to 22, OLS 1 to 30, OCS 15 to 26.

ACCESS: By road from Pemberton, 7 miles.

OWNER: PINE LAKE MINING CO. LTD., 616, 402 West Pender Street, Vancouver 3.

METALS: Copper, molybdenum.

DESCRIPTION: Chalcopyrite, molybdenite, and pyrite occur in quartz diorite and dioritized volcanic rocks.

WORK DONE: Geochemical soil survey, 41 samples covering KB 14 and OC 48; percussion drilling, 19 holes totalling 5,560 feet on KB 6, OL 2 and 4, and OLN 6. During 1971, Silver Standard Mines Limited carried out geological mapping at a scale of 1 inch equals 400 feet covering the OC and KB claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 227; Assessment Report 3625.

HAPPY VALLEY (No. 151, Fig. C)

LOCATION: Lat. 50° 16.5' Long. 122° 35' (92J/7E)
LILLOOET M.D. On the west side of Lillooet Lake, immediately north of the mouth of Ure Creek.

CLAIMS: HAPPY VALLEY 1 and 2.

ACCESS: By boat and road from Pemberton, 12 miles.

OWNER: PHILIP S. BALDEN, 2743 West 22nd Avenue, Vancouver 8.

WORK DONE: Line-cutting.

REFERENCE: Assessment Report 3988.

IVAN (No. 152, Fig. C)

LOCATION: Lat. 50° 31′ Long. 122° 55′ (92J/10W)
LILLOOET M.D. Between 5,000 and 7,000 feet elevation approximately 1 mile south of Tenquille Lake and 15 miles north-northwest of Pemberton.
CLAIMS: IVAN 1 to 16, Mineral Lease M-31 (SAINT PAUL, Lot 4811 and CROWN FRACTION, Lot 4812), Mineral Lease M-32 (SANTA BARBARA, Lot 4810).
ACCESS: By the Birkenhead River-Lake logging road from D'Arcy, or by helicopter from Garibaldi.
OWNER: JAMES C. BEGGS, 566 Shannon Crescent, North Vancouver.
WORK DONE: Airborne magnetometer, electromagnetic, and radioactivity survey.
REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1961, p. 29 (Phelps Dodge Corporation of Canada, Limited); Assessment Reports 365, 4154.

FALL (No. 153, Fig. C)

LOCATION: Lat. 50° 39′-41′ Long. 123° 27.5′-31′ (92J/11W, 12E)
LILLOOET M.D. Between 2,100 and 4,500 feet elevation approximately 1 mile south of the junction of Salal Creek and Lillooet River.
CLAIMS: FALL 1 to 42, VENT 1 to 30.
ACCESS: By helicopter from Pemberton Meadows, 12 miles.
OWNER: SILVER STANDARD MINES LIMITED, 808, 602 West Hastings Street, Vancouver 2.
METAL: Molybdenum.
WORK DONE: Surface geological mapping, 1 inch equals 500 feet; trenching, 375 feet on Vent claims.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 308, 309.

GRISWOLD (No. 154, Fig. C)

LOCATION: Lat. 50° 54.7′ Long. 123° 25.5′ (92J/14W)
LILLOOET M.D. At approximately 5,000 feet elevation about 2 miles north of Bridge River in the valley of Thunder Creek.
CLAIMS: RUSSNOR 1 to 4, MEL 1 to 36.
ACCESS: By helicopter from Gold Bridge, 25 miles.
OWNER: Thunder Creek Mines Ltd.
OPERATOR: NEW JERSEY ZINC EXPLORATION COMPANY (CANADA) LTD., 905, 525 Seymour Street, Vancouver 2.
METALS: Copper, silver, gold, molybdenum.
WORK DONE: Surface diamond drilling, four holes totalling 409 feet on Russnor 4.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 311.

WAYSIDE (No. 156, Fig. C)

LOCATION: Lat. 50° 52.7′ Long. 122° 49.6′ (92J/15W)
LILLOOET M.D. At the western end of Carpenter Lake, 2 miles northeast of Gold Bridge.

CLAIMS: Mineral Lease M-57 (WAYSIDE, Lot 3036), Mineral Lease M-48 (ARGON, RADIUM, etc., Lots 3037 to 3040, 5471, 5503 to 5515, 5912 to 5918, 6955, and 6956), totalling 27.

ACCESS: By road from Gold Bridge, 2 miles.

OWNER: DAWSON RANGE MINES LTD., Box 466, Lillooet.

METALS: Gold, copper, lead, zinc, antimony.

DESCRIPTION: Siliceous shear zones in Bralorne augite diorite are mineralized with sulphides, native gold, and tellurides.

WORK DONE: Mucking out No. 4 adit.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1952, p. 113; *Geol. Surv., Canada*, Mem. 213, pp. 132-136.

CONGRESS (No. 155, Fig. C)

LOCATION: Lat. 50° 53.8′ Long. 122° 47.9′ (92J/15W)
LILLOOET M.D. At approximately 3,000 feet on the north shore of Carpenter Lake, 3 miles northeast of Gold Bridge.

CLAIMS: ACE, GOLD BELT, and Mineral Leases M-3, M-6, M-8, and M-67.

ACCESS: By road from Lillooet, 68 miles.

OWNER: ALICE ARM MINING LTD., 2080, 777 Hornby Street, Vancouver 1.

METALS: Antimony, gold, mercury.

DESCRIPTION: Pyrite, stibnite, and cinnabar occur in veins and as replacement bodies in greenstone.

WORK DONE: Opened caved portal (main haulage level); sampled veins.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1961, pp. 25, 26; 1965, p. 143; *Geol. Surv., Canada*, Mem. 213, pp. 102-105.

TRUAX (SPRUCE) (No. 157, Fig. C)

LOCATION: Lat. 50° 48.8′ Long. 122° 42.0′ (92J/15E)
LILLOOET M.D. At approximately 6,500 feet elevation near the headwaters of Truax Creek, 7 miles east-southeast of Gold Bridge.

CLAIMS: TRUAX 1 to 20.

ACCESS: By road from Gold Bridge, 17 miles.

OWNER: DAWSON RANGE MINES LTD., Box 466, Lillooet.

METALS: Gold, antimony.

DESCRIPTION: Several quartz veins and shear zones are located at or near the contact between Bridge River metasedimentary rocks and quartz diorite.

WORK DONE: Surface diamond drilling, one hole totalling 125 feet on Truax 6.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 225.

BUTE INLET 92K

OK (No. 58, Fig. C)

LOCATION: Lat. 49° 59' - 50° 04.5' Long. 124° 35'-43' (92K/2E; 92F/15E)
VANCOUVER M.D. The property is centred 12 miles northwest of Powell River between elevations of 1,000 and 2,000 feet.

CLAIMS: OK, IN, DEE, totalling 344.

ACCESS: By road from Powell River, 20 miles.

OPERATOR: GRANITE MOUNTAIN MINES LTD., 330, 470 Granville Street, Vancouver 2.

METALS: Copper, molybdenum.

DESCRIPTION: The OK property lies on the western flank of the Coast Plutonic Complex. Bedrock consists of massive, grey, medium to coarse-grained diorite gabbro, granodiorite, quartz diorite, and granite. The gabbro which underlies the margins of the property has been intruded by two pulses of granitic rocks which are represented by granodiorite and quartz monzonite. The entire area has been cut by a later dyke swarm.

WORK DONE: Surface workings mapped; surface geological mapping, 1 inch equals 400 feet covering Dee claims; induced polarization survey, 6 line-miles; geochemical survey, 300 samples; road construction, 10 miles; surface diamond drilling, 22 holes totalling 13,600 feet on OK 7, 8, 9, 19, 20, 22, 27, 30 and IN 161, 162.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 313.

BOB (No. 31, Fig. C)

LOCATION: Lat. (1) 50° 05' Long. 125° 13' (92K/3E)
Lat. (2) 50° 07' Long. 125° 15'
Lat. (3) 50° 10.2'-12' Long. 125° 9'-10.5'
NANAIMO M.D. On the east coast of Quadra Island, three locations – (1) Heriot Bay, (2) Hyacinthe Bay, and (3) Bold Point.

CLAIMS: (1) Bob 21 to 26; (2) BOB 1 to 20, S 1 to 6; (3) B 1 to 5, G 1 to 5, S 1 to 5, X 1 to 6, K 1 to 5.

ACCESS: By boat or floatplane from Campbell River, approximately 9 miles.

OWNER: STANLEY WESTON, 1367 West 46th Avenue, Vancouver 13.

METAL: Copper.

DESCRIPTION: Chalcocite, azurite, and malachite occur along a granite-limestone contact.

WORK DONE: Geological mapping, 1 inch equals 1,500 feet during 1971.

REFERENCE: Assessment Report 3522.

SOLYMAN, FREYA (No. 32, Fig. C)

LOCATION: Lat. 50° 10.6′ Long. 125° 08′ (92K/3E)
NANAIMO M.D. On the southwest end of Read Island, near Rosen Lake.
CLAIMS: PL 1 to 32.
ACCESS: By boat or floatplane from Campbell River.
OWNER: DATUM EXPLORATION LTD., 427, 470 Granville Street, Vancouver 2.
METALS: Copper, gold, silver.
WORK DONE: Line-cutting.
REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1930, p. 307; Assessment Report 3488.

COPPER BELL (No. 30, Fig. C)

LOCATION: Lat. 50° 07.6′ Long. 125° 16.0′ (92K/3W)
NANAIMO M.D. At approximately 400 feet elevation on Quadra Island, 3 miles northwest of Heriot Bay.
CLAIMS: COPPER BELL 1 to 6.
ACCESS: By ferry or road from Campbell River, 10 miles.
OWNER: QUADRA BELL MINING CO. LTD., 1161 South Murphy Street, Campbell River.
METAL: Copper.
DESCRIPTION: Chalcocite is associated with quartz in vertical faults in Karmutsen volcanic rocks.
WORK DONE: Trenching, 767 cubic feet on Copper Bell 1.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 314.

BELL (No. 28, Fig. C)

LOCATION: Lat. 50° 01.5′ Long. 125° 33′ (92K/4E)
NANAIMO M.D. On the north shore of the west end of Lower Campbell Lake, 17 miles west of Campbell River.
CLAIMS: BELL 1 to 6, 8.
ACCESS: By road from Campbell River, 17 miles.
OWNER: J. L. WILLIAMS, 3282 West 27th Avenue, Vancouver 8.
WORK DONE: Line-cutting.
REFERENCES: Assessment Reports 1830, 3644.

WIN, ZAP (No. 29, Fig. C)

LOCATION: Lat. 50° 04′ Long. 125° 32′ (92K/4E)
NANAIMO M.D. At elevations of 700 to 1,200 feet between Mohun and Boot Lakes, 12 miles west of Campbell River.
CLAIMS: WIN 1 to 10, ZAP 1 to 28.
ACCESS: By logging road from Campbell River.

(92K/5W)

OPERATOR: ALMAZA MINING CO. LTD., 3797 Kingsway, Burnaby 1.
METAL: Copper.
DESCRIPTION: Copper mineralization occurs as disseminations and in silicified fractures in amygdaloidal basalt.
WORK DONE: Geological mapping, magnetometer and geochemical surveys during 1971.
REFERENCE: Assessment Report 3705.

TOWER (No. 101, Fig. C)

LOCATION: Lat. 50° 15.5' Long. 125° 46.5' (92K/5W)
NANAIMO M.D. One mile northeast of the Salmon River, 9 miles southeast of Sayward.
CLAIMS: TOWER 1 to 6.
ACCESS: By road from Sayward, 15 miles.
OWNER: WESTERN STANDARD SILVER MINES LTD., Box 462, Kelowna.
WORK DONE: Surface geological mapping; preliminary geochemical survey.

RED (No. 57, Fig. C)

LOCATION: Lat. 50° 17.0' Long. 124° 55.0' (92K/7W)
VANCOUVER M.D. At approximately 2,000 feet elevation on the northwest side of West Redonda Island.
CLAIMS: RED 1 to 4, 9, and 10, TISH 1 to 5.
ACCESS: By helicopter from Campbell River, 25 miles.
OWNER: TECK CORPORATION LTD., 700, 1177 West Hastings Street, Vancouver 1.
METALS: Copper, molybdenum.
DESCRIPTION: Quartz and hornblende porphyries intrude diorite. Pyrite, chalcopyrite, and molybdenite mineralization is reported.
WORK DONE: Magnetometer survey, 2.5 line-miles covering all claims; electromagnetic survey, 1.5 line-miles covering Red 1, 3, 9, 10 and Tish 1, 4.
REFERENCES: Assessment Reports 638, 4167.

ALERT BAY 92L

TONY, KA (No. 35, Fig. C)

LOCATION: Lat. 50° 04' Long. 126° 59' (92L/2W, 3E)
ALBERNI M.D. Between 1,000 and 2,000 feet elevation at the confluence of Rowland Creek and Kaouk River, 5.5 miles east of Fair Harbour.
CLAIMS: TONY 1 to 38, KA 1 to 48.
ACCESS: By road or helicopter from Fair Harbour, 6.5 miles.
OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie

Street, Vancouver 5.
METALS: Copper, lead, zinc.
DESCRIPTION: Andesite, basalt, tuff, breccia, and limestone of the Vancouver Group are intruded by granitic rocks. Some of the contacts show epidote, chlorite, and K-feldspar alteration. Faulting is extensive. Small veins contain pyrite, pyrrhotite, chalcopyrite, sphalerite, and galena.
WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet covering Tony 1-10, 24-28, 30-32 and KA 25-28; geochemical soil survey, 283 samples covering Tony 1-5, 7, 9, 23-25, 30.

BROOKS (No. 40, Fig. C)

LOCATION: Lat. 50° 14.5' Long. 127° 43' (92L/4E, 5E)
NANAIMO M.D. At an elevation of 200 feet at the head of Klaskish Inlet, 22 miles southeast of Winter Harbour.
CLAIMS: BROOKS 1 to 24.
ACCESS: By boat from Winter Harbour, 20 miles.
OPERATOR: CANADIAN SUPERIOR EXPLORATION LIMITED, 2201, 1177 West Hastings Street, Vancouver 1.
METALS: Copper, lead, zinc.
DESCRIPTION: Triassic Karmutsen volcanic rocks are intruded by a Jurassic granitic stock from which radiates granitic to rhyodacitic dykes. Skarn-type copper, lead, and zinc mineralization occurs along contacts. Disseminated chalcopyrite also occurs in rhyodacite dykes.
WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet covering all claims; geochemical soil survey, 270 samples covering Brooks 1 and 2; trenching, 2,058 feet on Brooks 1-7, 10, 12, 22.

TENT (No. 42, Fig. C)

LOCATION: Lat. 50° 18' Long. 127° 38' (92L/5E)
NANAIMO M.D. At approximately 1,500 feet elevation near the headwaters of Klaskish River, 8 miles southwest of Port Alice.
CLAIMS: TENT 1 to 28, 30 to 67, 130, TENT 29 and 131 Fractions.
ACCESS: By helicopter from Port Hardy, 30 miles.
OWNER: BRANTA EXPLORATIONS LTD., 203, 846 West Hastings Street, Vancouver 1.
METALS: Copper, molybdenum.
DESCRIPTION: A quartz diorite stock intrudes Bonanza volcanic rocks. Copper and molybdenum mineralization occurs as disseminations and on fracture surfaces.
WORK DONE: Surface diamond drilling, two holes totalling 602 feet on Tent 16 and 17.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 318.

BRAD (No. 41, Fig. C)

LOCATION: Lat. 50° 19.5' Long. 127° 40.5' (92L/5E)
NANAIMO M.D. At approximately 1,500 feet elevation on the south shore of Quatsino Sound, 2 miles east of Mount Kotzebue, 11 miles southeast of the Mahatta River.

CLAIMS: K 1 to 40.

ACCESS: By road from the Mahatta River, 11 miles.

OPERATOR: PERRY, KNOX, KAUFMAN, INC., Box 14336, Spokane, Washington 99214.

METAL: Copper.

DESCRIPTION: Several weak showings of disseminated and fracture-controlled chalcopyrite and pyrite occur in diorite and Bonanza sedimentary rocks.

WORK DONE: Geochemical survey, 330 soil samples and 40 rock chip samples covering K 3, 5, and 12.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 206 (Brad); Assessment Reports 2652 (Brad), 3792.

JAY (No. 43, Fig. C)

LOCATION: Lat. 50° 26.5' Long. 127° 44' (92L/5E)
NANAIMO M.D. Three miles east-southeast of Mahatta River settlement.

CLAIMS: JAY, totalling 19.

ACCESS: By helicopter from Port Alice, 17 miles.

OWNERS: PECHINEY DEVELOPMENT LIMITED, 701, 744 West Hastings Street, Vancouver 1 and THE DOWA MINING CO. LTD., 1102, 1111 West Hastings Street, Vancouver 1.

DESCRIPTION: The claims are underlain by pyroclastic and flow rocks of the Bonanza Subgroup and are of rhyolitic and andesitic composition.

WORK DONE: Surface geological mapping, 1 inch equals 500 feet covering all claims; geochemical soil and silt survey, 60 samples covering Jay 5, 7, and 9.

YREKA (No. 45, Fig. C)

LOCATION: Lat. 50° 27.4' Long. 127° 34.0' (92L/5E)
NANAIMO M.D. Between 500 and 2,950 feet elevation on the west side of Neroutsos Inlet, 4 miles northwest of Jeune Landing.

CLAIMS: Sixteen Crown-granted and 77 located claims.

ACCESS: By boat from Jeune Landing, approximately 4 miles.

OWNER: Green Eagle Mines Ltd.

OPERATOR: ISO EXPLORATIONS LTD., 700, 1177 West Hastings Street, Vancouver 1.

METALS: Copper, zinc.

DESCRIPTION: The claims are underlain by limestone and by Bonanza tuffs and volcanic flows. Mineralization occurs in skarn and in sedimentary and volcanic rocks adjacent to shear zones and appears to be related to numerous northwesterly striking andesite and dacite dykes. Sulphide minerals include pyrite, pyrrhotite, chalcopyrite, sphalerite, and galena. Magnetite is present locally.

WORK DONE: Surface geological mapping, 1 inch equals 100 feet covering Superior, New Comstock, and Mountain King Crown grants; electromagnetic, self-potential, and magnetometer surveys, approximately 10 line-miles covering Edison, Edison Fraction, Barney No. 1 and No. 2, Superior, New Comstock, and Mountain King Crown grants; geochemical soil survey, approximately 600 samples covering same claims; hand trenching on Edison and Barney No. 2; surface diamond drilling, six holes totalling 2,000 feet on Barney No. 1 and No. 2 and Edison.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 317.

R (No. 44, Fig. C)

LOCATION: Lat. 50° 27.5'-29.5' Long. 127° 34'-38' (92L/5E)
NANAIMO M.D. On the north slope of Comstock Mountain, near Buchholz Channel, 8 miles northwest of Port Alice.

CLAIMS: R 1 to 14, 17 to 30, 33 to 48, SU 1 to 6, 11 to 16.

ACCESS: By boat from Coal Harbour.

OWNER: CELTIC MINERALS LTD., 107, 325 Howe Street, Vancouver 1.

WORK DONE: Line-cutting, 6 miles; geochemical soil survey, 316 samples.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 317, 318; Assessment Report 3652.

OLD SPORT MINE (No. 138, Fig. C)

By W. C. Robinson

LOCATION: Lat. 50° 23' Long. 127° 14.5' (92L/6E)
NANAIMO M.D. South end of Benson Lake, on the west side of Benson River.

ACCESS: By 26 miles of road from Port McNeill.

OWNER: COAST COPPER COMPANY LIMITED (controlled by Cominco Ltd.), Port McNeill.

METAL: Copper (production shown in Table I).

DESCRIPTION:

The Old Sport mine is a characteristic skarn deposit of the Insular Tectonic Belt. Copper occurs at the Karmutsen Formation contact and within selected beds of the Quatsino limestone mostly adjacent to diorite sills extending outward from the main intrusive. Magnetite ore occurs chiefly in the limestone below the Bonanza contact.

The history of production was as follows: The construction of the mine plant, the 1,800-kilowatt hydro plant, and the 750-ton-per-day concentrator was completed in 1962. Milling operations commenced on August 27, 1962, producing a copper concentrate that was trucked to the Port McNeill loading terminal for shipment. During 1963 construction was started on the addition to the concentrator of a magnetite recovery plant with a daily capacity of 250 tons of magnetite concentrate. Iron concentration commenced at the beginning of March 1964 and production of both a copper concentrate and an iron concentrate continued until about September 1970 when iron concentration was discontinued. Production of a copper concentrate, using the flotation method, continued until December 1972.

Between commencement of milling in August 1962 and the cessation of operations in December 1972, a total of 2,900,366 tons of ore was treated.

WORK DONE: During 1972 trackless mining methods completed 929 feet of drifting. Other work included 2,637 feet of subdrifting, 3,493 feet of raising, and 17,433 feet of underground diamond drilling. On September 12, production, which was obtained by shrinkage stope mining methods, was reduced from about 800 tons per day to about 560 tons per day.

REFERENCES: Dolmage, V., *Geol. Surv., Canada,* Sum. Rept., 1918, Pt. B; Gunning, H. C., *Geol. Surv., Canada,* Sum. Rept., 1929, Pt. A; *Minister of Mines, B.C.,* Ann. Rept., 1960, pp. 100, 101; 1966, pp. 66-68; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 319.

LM, HAP (No. 56, Fig. C)

LOCATION: Lat. 50° 18'-19.2' Long. 124° 58' - 125° 01' (92K/6E, 7W)
VANCOUVER M.D. At an elevation of 1,000 feet at the north end of Raza Island, 110 miles northwest of Vancouver.

CLAIMS: LM 1 to 20, HAP 1 to 8.

ACCESS: By boat or floatplane from Vancouver.

OWNER: FALCON EXPLORATIONS LIMITED, 107, 325 Howe Street, Vancouver 1.

METALS: Lead, zinc, copper.

DESCRIPTION: The property is underlain by intrusive rocks of mainly quartz monzonite composition. Some alteration occurs in a wide east-west-trending shear zone which crosses the island. Dykes ranging in composition from aplite to light grey diorite are common. Pyritization occurs within the shear zone. In addition, two small showings are reported. The first consists of sphalerite, galena, and minor chalcopyrite in association with a feldspathic dyke; the second consists of pyrite and minor chalcopyrite in sheared and altered quartz monzonite.

WORK DONE: Geological, geochemical, and magnetometer surveys during 1971.

REFERENCES: Assessment Reports 3446, 3447.

HAB (No. 36, Fig. C)

LOCATION: Lat. 50° 18.5' Long. 126° 46' (92L/7)
NANAIMO M.D. At the south end of Bonanza Lake, 25 miles southeast of Port McNeill.

CLAIMS: HAB 1 to 11.

ACCESS: By secondary road from Port McNeill.

OWNER: IMPERIAL OIL ENTERPRISES LTD., 500 Sixth Avenue SW., Calgary, Alta.

WORK DONE: Line-cutting.

REFERENCE: Assessment Report 3698.

A, B, C (No. 38, Fig. C)

LOCATION: Lat. 50° 20.5'-22' Long. 126° 52'-55' (92L/7W) NANAIMO M.D. On the north side of Kinman Creek, at the south end of Nimpkish Lake.

CLAIMS: A 1 to 11, 13 to 28, B 10 to 17, C 2, 4, 6, 8, 10.

ACCESS: By logging road from Port Hardy, 18 miles.

OWNER: WAVECOM DEVELOPMENT LTD., 309, 850 West Hastings Street, Vancouver 1.

DESCRIPTION: The claims are underlain by volcanic and sedimentary rocks of the Vancouver Group which have been intruded by Island Intrusions.

WORK DONE: Geochemical and magnetometer surveys.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 319; Assessment Report 3749.

NAN (No. 37, Fig. C)

LOCATION: Lat. 50° 21'-24' Long. 126° 35.7'-40' (92L/7E) NANAIMO M.D. On Catherine Creek, 5 miles east of Bonanza Lake, 19 miles southeast of Alert Bay.

CLAIMS: NAN 1 to 83.

ACCESS: By aircraft from Alert Bay.

OWNER: IMPERIAL OIL ENTERPRISES LTD., 500 Sixth Avenue SW., Calgary, Alta.

WORK DONE: Line-cutting.

REFERENCE: Assessment Report 3784.

BOYES (No. 33, Fig. C)

LOCATION: Lat. 50° 15.5'-18.5' Long. 126° 02'-05' (92L/8E) NANAIMO M.D. Between 1,500 and 2,000 feet elevation on the west side of Adam River, 2 miles southwest of Keta Lake.

CLAIMS: BOYES, BRUCE, GEO, DENNIS, KEVIN, totalling 103.

ACCESS: By private road from Sayward, 12 miles.

OPERATOR: CONOCO SILVER MINES LTD., Suite 3, 4647 Kingsway, Burnaby 1.

METALS: Copper, silver, gold.

DESCRIPTION: Chalcopyrite, chalcocite, and bornite occur in veins and as disseminations in volcanic rocks.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet and 1 inch equals 100 feet covering Kevin and Bruce; geochemical soil survey, 494 samples covering Kevin and Bruce; road construciton, 1 mile; trails constructed and repaired; trenching on Bruce; surface diamond drilling, 3,822 feet.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 320.

ROONEY (No. 34, Fig. C)

LOCATION: Lat. 50° 21.5′ Long. 126° 09′ (92L/8E)
NANAIMO M.D. Near Rooney Lake, 10 miles west-southwest of Kelsey Bay.

CLAIMS: CATHY 1 to 40, BILLY 1 to 36, BERNA 1 to 4, MOON 1 to 8.

ACCESS: By logging road from Sayward, 10 miles.

OWNER: SAYWARD EXPLORATIONS LTD., 3837 Cypress Street, Vancouver 9.

DESCRIPTION: Chalcopyrite and bornite occur disseminated in amygdaloidal Karmutsen basalt.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; magnetometer survey, 3.25 line-miles covering Billy 6, 21, Berna 3, 4, and Cathy 30-39.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 209; Assessment Report 3795.

I, STAN (No. 137, Fig. C)

LOCATION: Lat. 50° 29′-30′ Long. 126° 05.5′-08′ (92L/8E)
VANCOUVER M.D. At approximately 400 feet elevation 1 mile west of Port Neville, 8 miles north-northwest of Kelsey Bay.

CLAIMS: I 1 and 2, STAN 1 to 3, 87 to 90, PORT 3 to 22.

ACCESS: By trail from Johnstone Strait, approximately 1 mile.

OWNER: STANLEY WESTON, 1850 Southwest Marine Drive, Vancouver 14.

METAL: Copper.

DESCRIPTION: Bornite, chalcopyrite, and chalcocite occur in shears, fractures, and veins associated with epidote and quartz in Karmutsen basalts.

WORK DONE: Surface and underground workings mapped; magnetomter survey covering Port claims; trenching, 120 cubic yards on I 2 and Stan 3.

REFERENCE: Assessment Report 4178.

DEMERARA (No. 39, Fig. C)

LOCATION: Lat. 50° 35′ Long. 126° 52′ (92L/10W)
NANAIMO M.D. On Pearse Island, in Johnstone Strait, 2 miles east of Alert Bay.

CLAIMS: SEA 1 to 36.

ACCESS: From Campbell River or Kelsey Bay by floatplane to Alert Bay thence by boat for 2 miles.

OPERATOR: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Very minor chalcopyrite, bornite, pyrite, and pyrrhotite occur as disseminations and in amygdules in Karmutsen flows and breccias. Narrow better grade areas, of very limited size, are associated with northwest and northeast-trending fracture and fault zones.

(92L/11W, 12E)

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet covering all claims.
REFERENCE: *Minister of Mines, B.C.,* Ann. Rept., 1929, p. 385.

ISLAND COPPER MINE (No. 139, Fig. C)

By K. E. Northcote and W. C. Robinson

LOCATION: Lat. 50° 36.0′ Long. 127° 28.3′ (92L/11W, 12E)
NANAIMO M.D. Between sea-level and 300 feet elevation on the north side of Rupert Arm, Port Hardy.
CLAIMS: One Hundred and seventy-five claims and fractions including BAY, COVE, JIM, COIR, RUPERT, INLET, ART.
ACCESS: From Port Hardy by road, 10 miles.
OWNER: UTAH MINES LTD., 412, 510 West Hastings Street, Vancouver 2; mine office, Box 370, Port Hardy.
METALS: Copper, molybdenum (production shown in Table I).
DESCRIPTION:

INTRODUCTION: The Island Copper mine lies in the lower part of the Bonanza volcanic pyroclastic sequence which was intruded by a digitating quartz feldspar porphyry dyke, a differentiate of Island Intrusions. Emplacement and crystallization of the dyke was accompanied by a complex history of brecciation, fracturing, metasomatism, hydrothermal alteration, and mineralization in a subvolcanic environment.

REGIONAL ASPECTS: The combination of similar chemistry, history of magmatic evolution, and similar radiometric age determinations suggest that Bonanza volcanic rocks and Island Intrusions are co-magmatic. A histogram of refractive indices of over 300 samples, Figure 30 indicates a continuous range of compositions for Bonanza volcanic rocks from basalt to rhyolite. Figure 31 is a chemical variation diagram published earlier by Northcote and Muller (1972). Although silicate analyses of the most basic intrusive rocks are lacking on Figure 31, it is evident that Island Intrusions and Bonanza volcanic rocks have similar compositions and lie along the same evolutionary line. Age determinations for plutonic rocks and Bonanza volcanic rocks from northern Vancouver Island are illustrated on Figure 32 and are listed on the accompanying table. Figure 32, with the exception of sample KN69-10, 103± shows the similarity of Bonanza and Island Intrusion radiometric ages. The Bonanza whole rock determinations tend to give radiometric ages slightly younger than the plutonic rocks which intrude the same sequence elsewhere in the map-area. The whole rock radiometric dates for Bonanza volcanic rocks, although analytically accurate to within narrow limits, must be considered to be minimum ages for these rocks. The younger ages were obtained from rocks of rhyodacite composition containing various amounts of K-feldspar. These rocks would be expected to lose radiogenic argon and give radiometric ages younger than their absolute ages. For this reason KN69-10, although analytically a valid determination, is discounted in favour of determinations from similar rocks from the same stratigraphic position which give older radiometric dates.

Muller proposes a maximum thickness of 8,500 feet for Bonanza volcanic rocks in the Alert Bay – Cape Scott map-area (Muller, Northcote, and Carlisle, 1973). If the Bonanza volcanic rocks and Island Intrusions were co-magmatic, magma penetrating the Bonanza rocks early in the volcanic period and later magma penetrating higher in the Bonanza sequence would have considerably less than the maximum thickness of overlying material.

Subvolcanic conditions can be envisaged at the top of the magma chamber. Magma forming Island Intrusions penetrated upwards into the base of the Bonanza succession while at the same time it broke through to the surface at local volcanic centres and extruded volcanic rocks higher in the Bonanza sequence. Tapping of reservoirs of varied stages of differentiation might account for interbedded flows and pyroclastic rocks of compositions ranging from basaltic andesite to rhyolite.

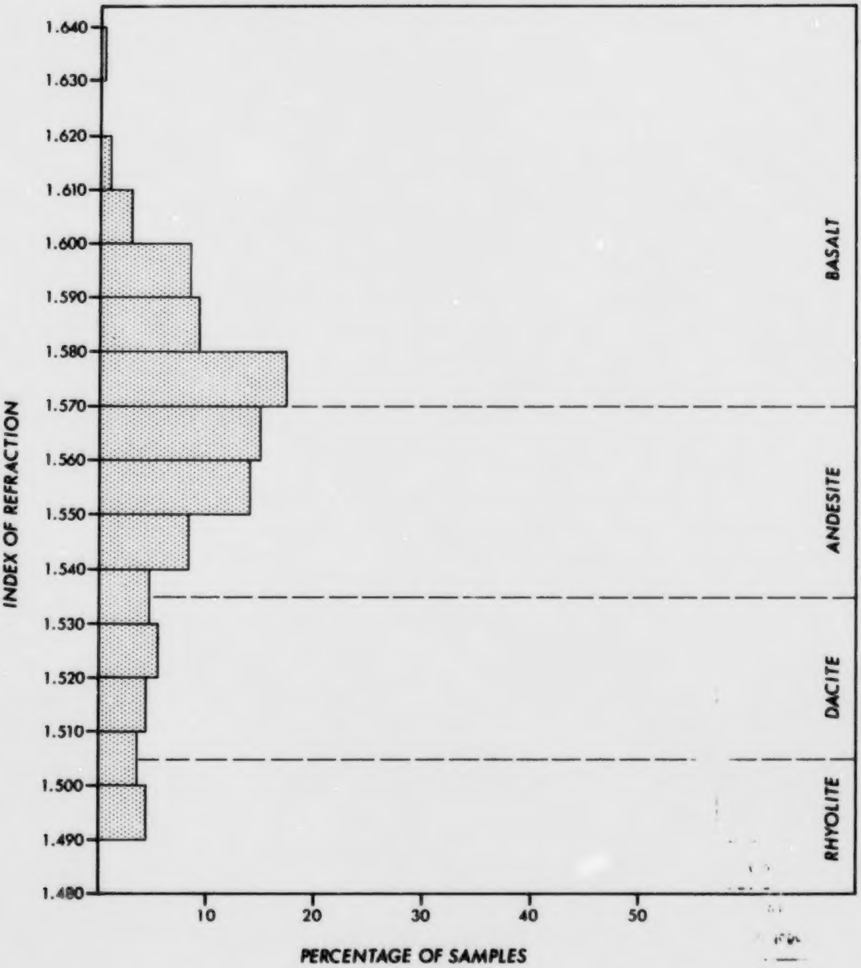


Figure 30. Frequency plot of refractive index determinations of fused Bonanza volcanic rocks (313 samples).

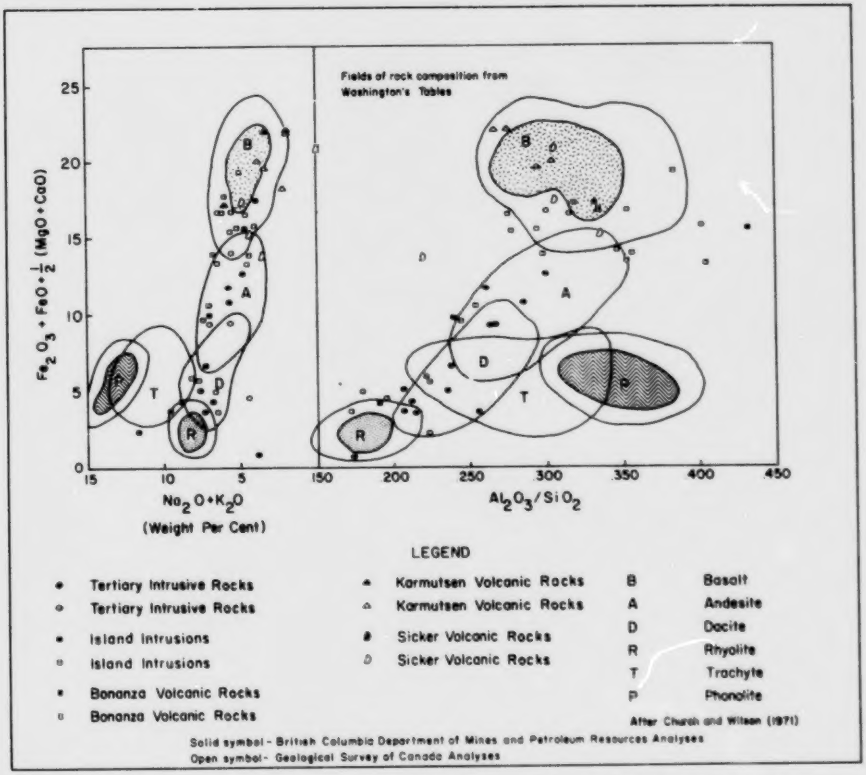


Figure 31. Chemical variation diagram of Vancouver Island volcanic and intrusive rocks (from Northcote and Muller).

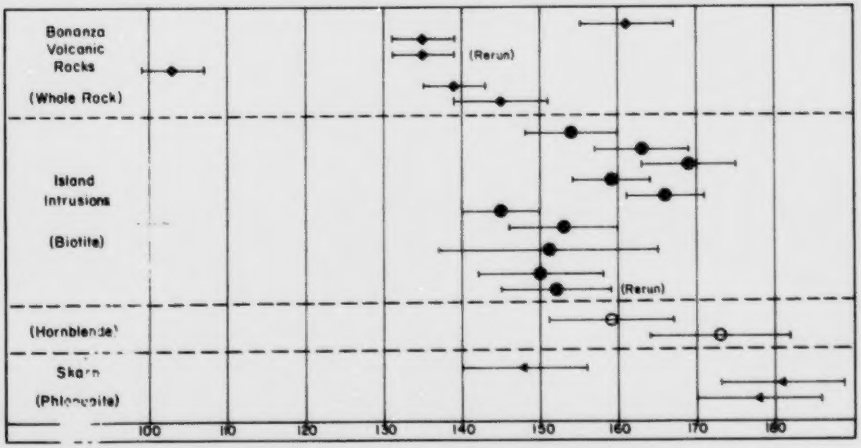


Figure 32. Diagrammatic representation of K/Ar age determinations, northern Vancouver Island. (Age determinations by Harakal and White, University of British Columbia and by the Geological Survey of Canada.)

GEOLOGY OF THE ISLAND COPPER MINE: The Island Copper orebody lies within moderately southerly dipping brecciated tuff, lapilli and tuff breccia, of andesite and basaltic andesite composition, which comprise the lower part of the Bonanza pyroclastic sequence. These volcanic rocks are cut by a northerly dipping, northwesterly trending, digitating quartz feldspar porphyry dyke which presumably was emplaced in a pre-existing fracture or shear zone. Figure 33 is a plan of the +40 and +80 benches in the northwest part of Island Copper pit in July 1972.

The quartz feldspar porphyry is flanked by a complicated, multigeneration breccia zone and fracture system. Breccias containing rounded or milled fragments of quartz feldspar porphyry and altered Bonanza rocks adjacent to and overlying the porphyry suggests at least one but possibly several episodes of explosive brecciation or gaseous streaming (Plates VIIA and VIIB). The complexity and intensity of early brecciation and fracturing is particuarly well displayed in the open pit on the north side of the porphyry. Brecciation is less intense a short distance outward from the porphyry and within about 200 feet the dislocated breccia has given way to systems of intense fracturing or crackle breccia. Several generations of fracturing are evident by crosscutting relationships of veins of similar and differing composition. During and between periods of brecciation and fracturing the complex fracture systems were permeated by hydrothermal, silica-rich solutions, differentiated porphyry, and its siliceous derivatives; some of which carried metals.

A gross zonal pattern of alteration of wallrocks accompanied emplacement of the quartz feldspar porphyry dyke system. Remnant biotitization is visible outside the zone of most intense brecciation, fracturing, and alteration and grades to propylitic alteration outside the ore zone. The intensity of early brecciation and fracturing appears to have determined the degree of silica and phyllic alteration superimposed on biotitic and prophylitic alteration. Silica and phyllic alteration ranges from quartz saturated, through pervasive phyllic alteration to phyllic alteration in random and regular fracture patterns. Later fracture systems contain laumontite and calcite and some still later fractures and shear zones contain pyrobitumen. At the northwest end of the ore zone a complex pyrophyllite-dumortierite-quartz porphyry breccia forms a cap-like zone of intense argillic alteration over the top of the quartz feldspar porphyry and altered, mineralized, brecciated Bonanza rocks (Plate VIIIA). D. G. Cargill is presently engaged in a detailed study of alteration associated with the Island Copper ore deposit as a Ph.D. dissertation at the University of British Columbia.

Mineralization consists mainly of fine-grained chalcopyrite in fractures, chalcopyrite associated with quartz veinlets, and very fine-grained chalcopyrite disseminated in silicified, sericitized, and biotitized Bonanza rocks (Plate VIIB). Fine-grained magnetite is commonly associated with copper mineralization. Molybdenite occurs in fractures and is found throughout the mineralized zone but is particularly abundant in association with silicified and biotitized rocks. Hematite and pyrrhotite, although both present, are not abundant in the altered zone.

(92L/11W, 12E)

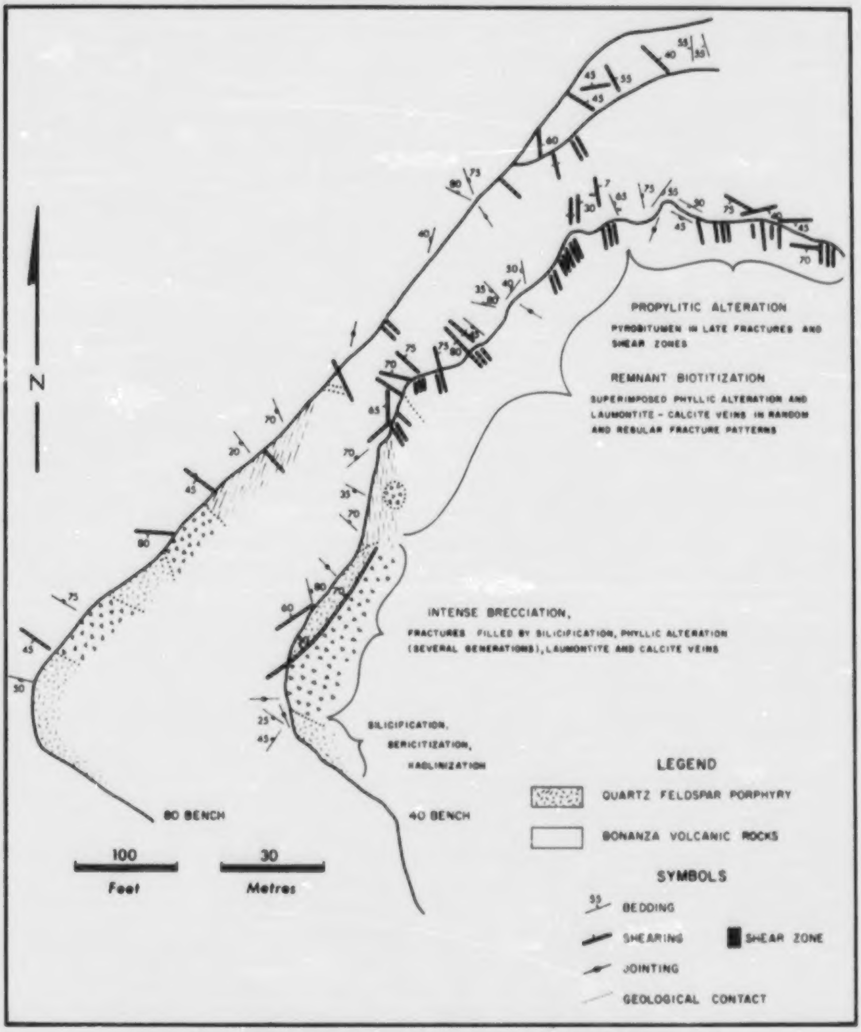

N
PROPYLITIC ALTERATION
PYROBITUMEN IN LATE FRACTURES AND SHEAR ZONES
REMNANT BIOTITIZATION
SUPERIMPOSED PHYLLIC ALTERATION AND LAUMONTITE - CALCITE VEINS IN RANDOM AND REGULAR FRACTURE PATTERNS
INTENSE BRECCIATION,
FRACTURES FILLED BY SILICIFICATION, PHYLLIC ALTERATION (SEVERAL GENERATIONS), LAUMONTITE AND CALCITE VEINS
SILICIFICATION,
SERICITIZATION,
KAOLINIZATION
80 BENCH
40 BENCH
100
Feet
30
Metres
LEGEND
QUARTZ FELDSPAR PORPHYRY
BONANZA VOLCANIC ROCKS
SYMBOLS
55
BEDDING
SHEARING
SHEAR ZONE
JOINTING
GEOLOGICAL CONTACT

Figure 33. Sketch map of part of the open pit at Island Copper mine.

AGE OF THE ISLAND COPPER DESPOSIT: A sample of biotite (KN68-177A) taken from the Rupert Inlet stock (Plate VIIIB) gave a radiometric age of 154±6 million years. This pluton, although it has a matrix rich in orthoclase, has similar coarse-grained, rounded quartz phenocrysts characteristic of the quartz feldspar porphyry at Island Copper (Plate IX). Because of the compositional and textural similarity and the close spatial relationship the two are considered to be genetically related. The 154±6 million year radiometric age for the Rupert Inlet stock would apply to the Island Copper quartz feldspar porphyry dyke. Because the Island Copper orebody appears to be directly related to the quartz feldspar porphyry dyke mineralization probably occurred about 154 million years ago. No direct measurements have been made of the age of the Island Copper orebody.

WORK DONE:

The mine is operated on a continuous three-shift basis. In addition to ore that was trucked directly to the nearby concentrator, 29,533,000 tons of waste material was removed from the pit during the year. A portion of the waste material was placed upon land adjacent to the pit and the remainder was deposited into Rupert Arm. Mining at this operation is done with benches placed at 40-foot intervals. At year-end the lowest elevation in the pit was 40 feet below sea-level. Equipment in the pit consists of nineteen 120-ton Unit Rig M-120 trucks, four 15-cubic-yard P&H electric shovels, and two 60-R Bucyrus-Erie rotary drills. During the year the construction of a molybdenum circuit in the mill was completed and construction was started on the addition of three ball mills. Tailings from the concentrator are discharged directly into Rupert Arm. During the year the construction of an emergency tailings impoundment, capable of storing a quantity of tailings that could be produced in a six-month period, was completed.

REFERENCES:

B.C. Dept. of Mines & Pet. Res., G.E.M., 1971, pp. 320, 321; Cargill, D. G., Ph.D. dissertation (in preparation), *U.B.C.*, personal communication; Muller, J. E. and Carson, D.J.T. (1969), Geology and Mineral Deposits of the Alberni Map-area, British Columbia, *Geol. Surv., Canada*, Paper 68-50; Muller, J. E., Northcote, K. E., and Carlisle, Donald (in press), Geology and Mineral Deposits of the Alert Bay-Cape Scott Map-area, British Columbia; Northcote, K. E., Island Copper Mine, *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, pp. 267-269; Northcote, K. E. and Muller, J. E. (1972), Volcanism, Plutonism, and Mineralization, Vancouver Island, *C.I.M.*, Bull., October, 1972; Sutherland Brown, A. (1966), Tectonic History of the Insular Belt of British Columbia, *C.I.M.*, Sp. Vol. No. 8; Sutherland Brown, A. (1968), Geology of the Queen Charlotte Islands, *B.C. Dept. of Mines & Pet. Res.*, Bull. 54; Young, M. J. and Rugg, E. S. (1971), Geology and Mineralization of the Island Copper Deposit, *Western Miner*, Vol. 44, No. 2, p. 21.

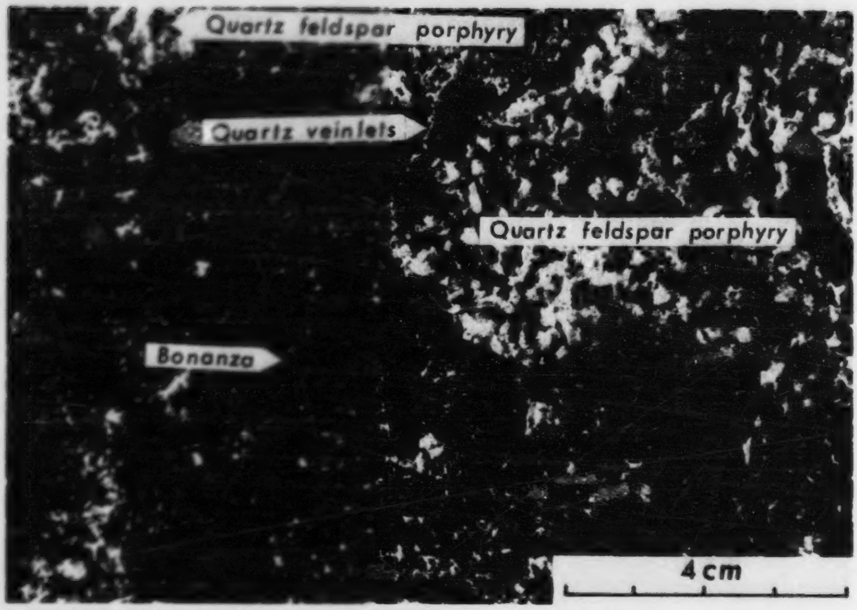

Quartz feldspar porphyry
Quartz veinlets
Quartz feldspar porphyry
Bonanza
4 cm

Plate VIIA. Breccia flanking quartz feldspar porphyry at Island Copper mine (70-KN-23). Rounded quartz feldspar porphyry fragments and silicified Bonanza volcanic fragments containing magnetite are in a silicified matrix of small fragments of porphyry and volcanic rocks.

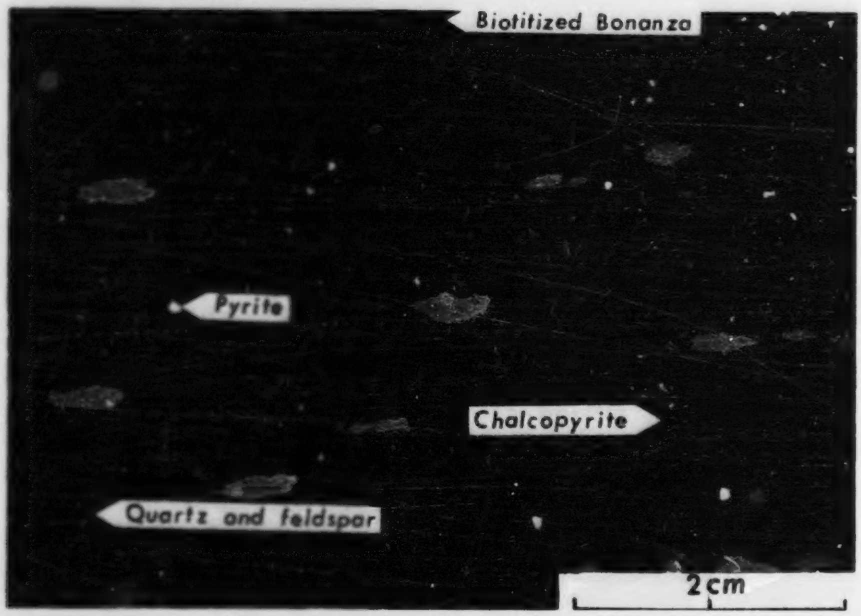

Biotitized Bonanza
Pyrite
Chalcopyrite
Quartz and feldspar
2 cm

Plate VIIB. Mineralized breccia from ore zone at Island Copper mine. Fragments of biotitized Bonanza tuff containing magnetite in a very fine-grained siliceous feldspathic matrix. Mineralization consists of disseminated pyrite and chalcopyrite.

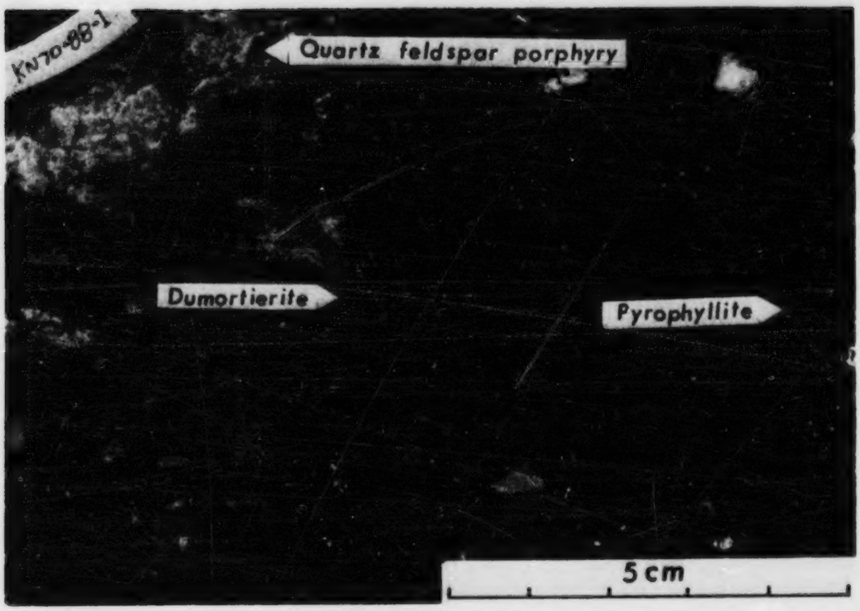

KN70-88-1
Quartz feldspar porphyry
Dumortierite
Pyrophyllite
5 cm

Plate VIIIA. Pyrophyllite – dumortierite – quartz feldspar porphyry breccia which caps quartz feldspar porphyry and mineralized Bonanza rocks at northwest end of Island Copper ore zone.

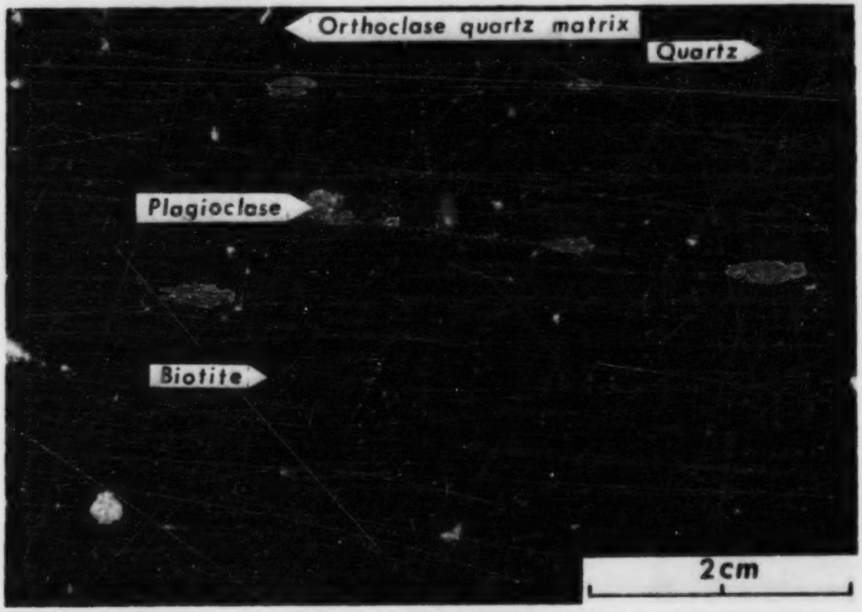

Orthoclase quartz matrix
Quartz
Plagioclase
Biotite
2 cm

Plate VIIIB. Porphyritic quartz monzonite (68-KN-177A), Rupert Inlet Stock. Coarse-grained plagioclase; rounded, resorbed quartz phenocrysts; and scattered biotite are in a fine-grained matrix of orthoclase and quartz.

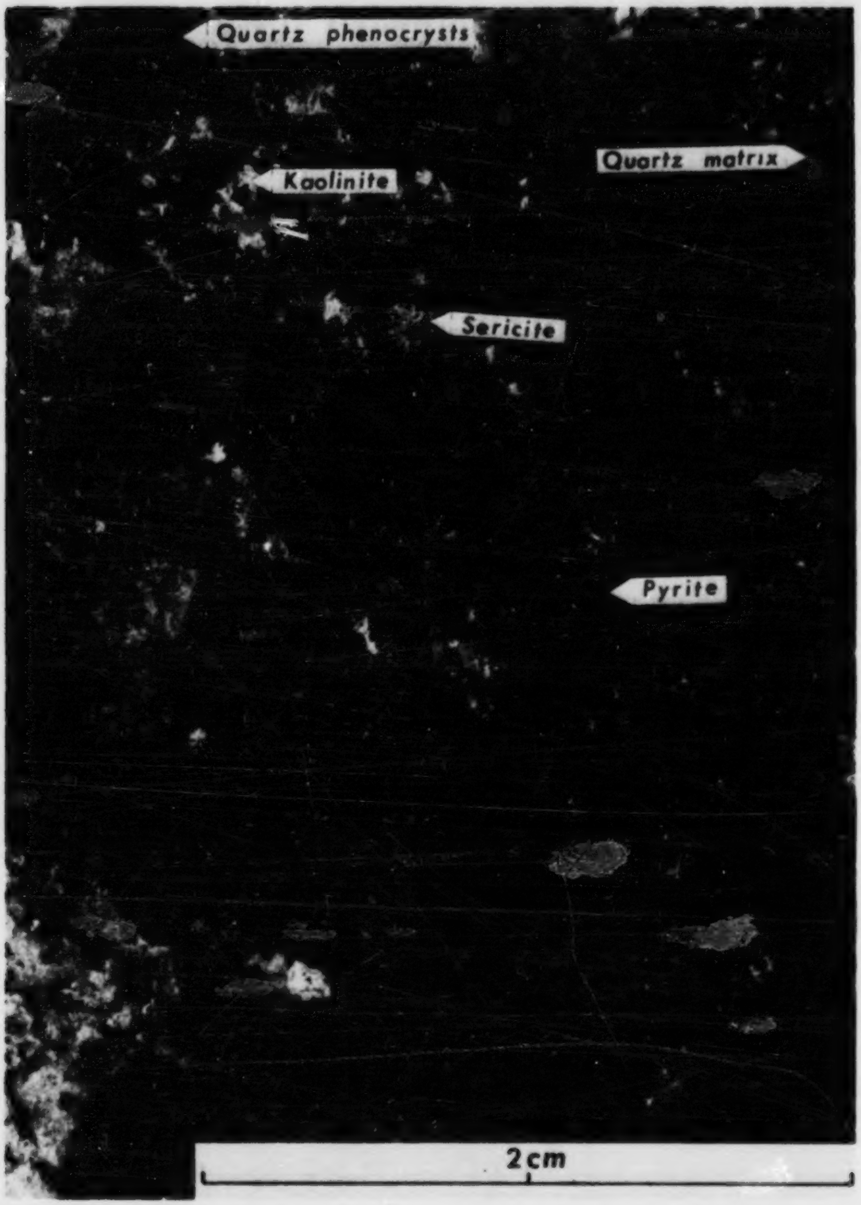

Quartz phenocrysts
Quartz matrix
Kaolinite
Sericite
Pyrite
2 cm

Plate IX. Quartz feldspar porphyry at Island Copper mine. Coarse-grained, rounded, resorbed quartz phenocrysts in a fine-grained quartz matrix containing blebs of sericite and kaolinized feldspar.

K/Ar AGE DETERMINATIONS, VANCOUVER ISLAND

I. J. E. Harakal and the late W. H. White, U.B.C. for British Columbia Department of Mines and Petroleum Resources

Sample	Material	Location	%K	%Ar^{*40}	Rock Type	Age
KN68-168	Whole rock	Apple Bay, Holberg Inlet 50°36′06″N 127°39′23″W	1.59	86	Bonanza andesite	161±8 m.y.
KN68-177A	Biotite	Rupert Inlet stock 50°35′35″N 127°25′15″W	3.67	55	Quartz monzonite	154±6 m.y.
KN69-8	Whole rock	Cape Scott 50°47′08″N 128°25′30″W	3.18	81	Bonanza rhyodacite	135±4 m.y.
KN69-8 (re-run)	Whole rock	Cape Scott 50°47′08″N 128°25′30″W	3.18	74	Bonanza rhyodacite	135±4 m.y.
KN69-10	Whole rock	South of Hansen's Lagoon 50°43′20″N 128°22′50″W	2.55	79	Bonanza rhyodacite	103±4 m.y.
KN69-98-VI	Whole rock	East side of Hansen's Lagoon 50°43′50″N 128°22′35″W	2.12	87	Bonanza rhyodacite	139±4 m.y.
KN69-234	Biotite	North Nahwitti Lake 50°42′40″N 127°50′16″W	5.40	92	Granodiorite	163±6 m.y.
KN69-264A	Biotite	Northwest Nahwitti Lake 50°43′05″N 127°52′30″W	5.83	93	Granodiorite	169±6 m.y.
KN69-327	Whole rock	San Josef 50°38′30″N 128°07′47″W	3.36	81	Bonanza rhyodacite	145±6 m.y.
CN70-152	Biotite	Southeast Nahwitti Lake 50°41′18″N 127°46′15″W	3.34	87	Granodiorite	159±5 m.y.
CN70-204B	Biotite	Soren Hill 50°49′50″N 128°04′20″W	6.28	96	Granodiorite	166±5 m.y.

PN70-179A	Biotite	Hepler Creek 50°41'43"N 127°52'34"W	1.78	76	Granodiorite	145±5 m.y.
PN70-124A	Biotite	Christensen Point 50°50'03"N 128°12'33"W	3.84	70	Intrusive	50.6±1.7 m.y.
KN68-158	Whole rock	East Straggling Island, Holberg Inlet 50°35'55"N 127°40'25"W	0.532	37	Dyke	32.3±1.6 m.y.

II. Geological Survey of Canada (J. E. Muller)

K/Ar-1694	Hornblende	Nahwitti Lake 50°43'05"N 127°52'30"W	0.40	61	Granodiorite	159±8 m.y.
K/Ar-1703	Hornblende	Nigei Island 51°54'30"N 127°44'25"W	0.52	62	Granodiorite	173±9 m.y.
K/Ar-1704	Biotite	Nigei Island 51°54'30"N 127°44'25"W	7.32	78	Granodiorite	153±7 m.y.

Geological Survey of Canada (reported by D.J.T. Carson, 1972)

GSC-65-14	Biotite	Nimpkish 'batholith'	5.23	74	Granodiorite	151±14 m.y.
GSC-66-27	Biotite	Bonanza 'batholith'	6.01	85	Granodiorite	150±8 m.y.
GSC-66-27 (re-run)	Biotite	Bonanza 'batholith'	6.01	86	Granodiorite	152±7 m.y.
GSC-66-28	Phlogopite	FL (Zeballos)	5.47	84	Skarn	148±8 m.y.
K/Ar-1652	Phlogopite	Merry Widow	7.29	85	Skarn	181±8 m.y.
K/Ar-1652 (re-run)	Phlogopite	Merry Widow	7.29	89	Skarn	178±8 m.y.

HAR, EXPO, KOERNER (No. 46, Fig. C)

LOCATION: Lat. 50° 32'-35.5' Long. 127° 05'-25.5' (92L/11)
NANAIMO M.D. Between sea-level and 500 feet east and south of Rupert Arm.

CLAIMS: HAR 1 to 9, 11, 13, 15 to 44, HAR Fraction, EXPO 1 to 18, ZAB 3 to 12, RIV 1 to 8. The holdings also include certain mineral and surface rights to a 43-square-mile area described as the KOERNER tract.

ACCESS: By road from Port Hardy, 20 miles.

OWNER: Riviera Industries & Resources Ltd.

OPERATOR: QUINTANA MINERALS CORPORATION, 1215, 555 Burrard Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Poorly exposed Bonanza and Karmutsen volcanic rocks underlie the claims. Bonanza rocks show alteration and weak mineralization on the north. Very deep cover, possibly indicating extension of the Holberg Inlet-Rupert Inlet fault, occurs in the centre of the property.

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 2,000 feet; magnetometer survey, 11.4 line-miles covering Har and Expo claims; geochemical survey covering all claims; road construction, 2 miles; rotary drilling, two holes totalling 1,000 feet on Koerner tract; percussion drilling, 13 holes totalling 3,100 feet on Har and Expo claims and Koerner tract.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 270.

RIB, REEF (No. 47, Fig. C)

LOCATION: Lat. 50° 38' Long. 127° 30.5' (92L/11W, 12E)
NANAIMO M.D. Two miles north of Rupert Inlet, 5 miles south of Port Hardy.

CLAIMS: RIB 1 to 14, RIB 1 to 8 Fractions, REEF 35 and 36.

ACCESS: From Port Hardy by logging road, 5 miles.

OWNER: GORDON MILBOURNE, 201, 569 Howe Street, Vancouver 1.

WORK DONE: Magnetometer and electromagnetic surveys covering Rib 1, 2, 6, 7, 8 Fractions and Reef 36 during 1971.

REFERENCE: Assessment Report 3474.

EXPO (No. 52, Fig. C)

LOCATION: Lat. 50° 36'-43' Long. 127° 41' - 128° 00' (92L/12)
NANAIMO M.D. At approximately 1,200 feet elevation between Holberg Inlet and Nahwitti Lake.

CLAIMS: Four hundred and ninety-two EXPO, 60 HEP, 12 DON Fractions, 9 EXPO Fractions, 2 WAN Fractions.

(92L/12E)

ACCESS: By road from Port Hardy, 36 miles.

OWNER: UTAH MINES LTD., 412, 510 West Hastings Street, Vancouver 2.

METALS: Copper, molybdenum.

DESCRIPTION: The claims are underlain mainly by Bonanza volcanic rocks and Parson Bay sedimentary rocks cut by stocks, plugs, and dykes of Island Intrusions. Pyrite is the most abundant and widespread sulphide particularly in areas of altered Bonanza volcanic rocks. Some chalcopyrite occurs in some of the altered rocks and molybdenite is a minor constituent.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 200 feet covering Expo claims; induced polarization and magnetometer survey, 10 line-miles covering Expo and Don claims; surface diamond drilling, eight holes totalling 3,410 feet on Expo 237, 238, and 258.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 322; Assessment Reports 3958, 4000.

BID, BON (No. 50, Fig. C)

LOCATION: Lat. 50° 36'-38' Long. 127° 32'-37' (92L/12E)
NANAIMO M.D. Between sea-level and 1,000 feet elevation immediately north of Coal Harbour.

CLAIMS: BID, BON, MAR, ADI, totalling approximately 105.

ACCESS: By road and boat from Port Hardy, 10 miles.

OWNERS: Consolidated Altair Development Limited (formerly Altair Mining Corporation Ltd.), Marshall Creek Copper Mines Ltd., and Garnet Exploration Corporation Ltd.

OPERATORS: GARNET EXPLORATION CORPORATION LTD., 1110, 510 West Hastings Street, Vancouver 2 and QUINTANA MINERALS CORPORATION, 1215, 555 Burrard Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Bonanza volcanic rocks and Parson Bay sedimentary rocks, which underlie the northern part of the property, are weakly and erratically altered. The southern part of the property is underlain by Lower Cretaceous sedimentary rocks (*see* G.E.M., 1970, Fig. 29, opp. p. 255).

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 2,000 feet covering all claims; geochemical rock and minor soil survey covering all claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 266; Assessment Reports 4001, 4002.

EB (No. 48, Fig. C)

LOCATION: Lat. 50° 36.5' Long. 127° 39.5' (92L/12E)
NANAIMO M.D. At Apple Bay, 4 miles west of Coal Harbour.

CLAIMS: EB 1 to 13, 15 to 17.

ACCESS: By boat 4 miles west of Coal Harbour and thence by old logging roads.

(92L/12E)

OWNERS: Marshall Creek Copper Mines Ltd. and Consolidated Altair Development Limited (formerly Altair Mining Corporation Ltd.).

OPERATORS: GARNET EXPLORATION CORPORATION LTD., 1110, 510 West Hastings Street, Vancouver 2 and QUINTANA MINERALS CORPORATION, 1215, 555 Burrard Street, Vancouver 1.

WORK DONE: Geological mapping; geochemical soil survey.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, 265; Assessment Report 3770.

IDA, BOB (No. 49, Fig. C)

LOCATION: Lat. 50° 37′-39.1′ Long. 127° 38′-40′ (92L/12E)

NANAIMO M.D. On Holberg Inlet, 4 miles northwest of Coal Harbour.

CLAIMS: Fifty-six IDA, BOB 874 and 875 Fractions.

ACCESS: By trail from Coal Harbour or by helicopter from Port Hardy.

OPERATOR: GARNET EXPLORATION CORPORATION LTD., 1110, 510 West Hastings Street, Vancouver 2.

WORK DONE: Geological, geochemical, and magnetometer surveys during 1971.

REFERENCE: Assessment Report 3575.

SEAL, HOL (No. 51, Fig. C)

LOCATION: Lat. 50° 36′-38′ Long. 127° 53.5′-56′ (92L/12W)

NANAIMO M.D. On Holberg Inlet 3.5 miles southeast of Holberg, 15 miles southwest of Port Hardy.

CLAIMS: HOL 1 to 6, JAY 1 to 10, NATIVE 1 to 23, 25.

ACCESS: By road from Holberg, 3.5 miles.

OWNER: HOLBERG MINES LTD., 103, 709 Dunsmuir Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Bornite and chalcopyrite are associated with a diabasic intrusive.

WORK DONE: Airborne magnetometer survey.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1921, p. 237; *Geol. Surv., Canada*, Sum. Rept., 1929, Pt. A, pp. 138, 139; Assessment Report 3771.

HPH, DORLON (No. 53, Fig. C)

LOCATION: Lat. 50° 41.5′ Long. 127° 47.5′ (92L/12W)
50° 41.3′ 127° 45.2′

NANAIMO M.D. The HPH workings are located 1 mile east-southeast of Nahwitti Lake on the Holberg forest development road. The Dorlon showings are 1,200 feet south of the junction of Nahwitti River and Kains Creek.

CLAIMS: HPH, RAIN, SILVA, TAXI, AUDREY, ALVIS, etc., totalling 81.

ACCESS: By the Holberg road from Port Hardy, 18 miles.

OWNER: GIANT EXPLORATIONS LIMITED, 2410, 700 West Georgia Street, Vancouver 1.

METALS: Silver, lead, zinc, iron.

DESCRIPTION: On the HPH workings galena, sphalerite, and/or magnetite pods and vein-like bodies are located near the contact between Karmutsen volcanic rocks and Quatsino limestone. On the Dorlon showings veins consisting mainly of sphalerite (6 inches to 2 feet wide) occur at the contact between Quatsino and Bonanza rocks, and are associated with quartz monzonite-diorite intrusive bodies. In addition, the Dorlon area contains magnetite-chalcopyrite mineralization within skarn zones in the Quatsino limestone.

WORK DONE: Surface geological mapping, 1 inch equals 100 feet covering Rain 1-4; electromagnetic survey, 3.8 line miles covering HPH 1-3 and 1.9 line-miles covering Rain 1 and 2; magnetometer survey, 4.7 line-miles covering HPH 1-2, One Fraction, Taxi 1, 2, Norma, and Crab and 10.6 line-miles covering Rain 1-4, Silva 5, 7, 8, 13, 14, and Alvis 1; road construction, 0.3 miles; trenching and stripping on HPH 1; surface diamond drilling, three holes totalling 350 feet on Rain 3 and 4.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 323 (Norman); Assessment Reports 3609, 3954, 4180.

RED DOG (No. 54, Fig. C)

LOCATION: Lat. 50° 42.6' Long. 127° 58.0' (92L/12W)
NANAIMO M.D. At approximately 1,000 feet elevation 4.5 miles north-northeast of Holberg.

CLAIMS: RED DOG 1 to 26, 29, 31 to 54, 69, 70, RED DOG Fraction.

ACCESS: By road from Holberg, 6 miles.

OWNER: WESTMINEX DEVELOPMENT LTD., 675 West Hastings Street, Vancouver 2.

METALS: Copper, molybdenum.

DESCRIPTION: Copper mineralization occurs as disseminations and in fractures in Bonanza metavolcanic rocks in association with quartz feldspar porphyry and quartz monzonite porphyry. Molybdenite occurs in fractures and as veinlets associated with quartz and sericite (*see* G.E.M., 1970, p. 259).

WORK DONE: Surface geological mapping, 1 inch equals 100 feet covering Red Dog Fraction and Red Dog 1, 3, 5, and 14; geochemical soil survey, 200 samples covering Red Dog 2, 4, and 6; surface diamond drilling, two holes totalling 2,030 feet on Red Dog 1.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 259.

ELK (No. 55, Fig. C)

LOCATION: Lat. 50° 44.5'-51' Long. 127° 59.5' - 128° 06.5' (102I/9E, 16E; 92L/13W)
Report on this property in section 102I/9E, 16E.

WET, DRY (No. 73, Fig. C)

LOCATION: Lat. 51° 6.0'-10.3' Long. 123° 55' - 124° 08.5' (92N/1E; 92O/4W)
CLINTON M.D. On the east and west shores of Chilko Lake, north of Five Brothers Peak.

CLAIMS: WET, DRY, PP, EZE, BEAU, totalling 77.

ACCESS: By boat from Chilko Lodge or by floatplane from Vancouver, Campbell River, or Williams Lake.

OPERATOR: COLMAC RESOURCES LTD., 405, 717 West Pender Street, Vancouver 1.

WORK DONE: Airborne magnetometer survey, 308 line-miles during 1971.

REFERENCE: Assessment Report 3477.

ALTA (No. 160, Fig. C)

LOCATION: Lat. 51° 11.5' Long. 124° 09' (92N/1E)
CLINTON M.D. On the south shore of Franklyn Arm, immediately east of the mouth of Good Hope Creek.

CLAIMS: ALTA 1 to 12, 17 to 28.

ACCESS: By boat from Chilko Lodge or by floatplane from Vancouver, Campbell River, or Williams Lake.

OWNER: CONSHELL RESOURCES LTD., 711, 475 Howe Street, Vancouver 1.

METALS: Copper, silver (in float).

DESCRIPTION: Metasedimentary and volcanic rocks are intruded by quartz diorite.

WORK DONE: Geological survey; airborne magnetometer, electromagnetic, and radioactivity surveys.

REFERENCE: Assessment Report 3948.

CINDY (No. 159, Fig. C)

LOCATION: Lat. 51° 13.3' Long. 124° 09.7' (92N/1E)
CLINTON M.D. At 3,860 feet elevation on the north side of Franklyn Arm, 4 miles west of Chilko Lake.

CLAIMS: CINDY 16 to 41.

ACCESS: By boat from Chilko Lodge, 27 miles.

OWNER: SHOREWEST MINING CO. LTD., 213, 475 Howe Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Triassic volcanic and sedimentary rocks are intruded by quartz diorite. Copper occurs in limy units of sedimentary rock.

WORK DONE: Surface geological mapping, 1 inch equals 1,500 feet covering Cindy 16-35 and 39-41; magnetometer survey covering same claims; geochemical soil survey, 90 samples.

(92N/9W)

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 324; Assessment Report 3949.

RUSTY (No. 161, Fig. C)

LOCATION: Lat. 51° 35' Long. 124° 29' (92N/9W)
CLINTON M.D. At approximately 6,500 feet elevation on Jamison Creek, 3 miles west of Tatlayoko Lake.
CLAIMS: RUSTY 9 to 26.
ACCESS: By helicopter from Tatlayoko Lake Post Office, 7 miles.
OPERATOR: CALTOR SYNDICATE, 1011, 2200 Yonge Street, Toronto, Ont.
METAL: Copper.
DESCRIPTION: Disseminated chalcopyrite occurs in Triassic sedimentary rocks.
WORK DONE: Reconnaissance silt and soil survey, 80 samples.

FLY (No. 162, Fig. C)

LOCATION: Lat. 51° 36' Long. 124° 29' (92N/9W)
CLINTON M.D. At approximately 6,900 fet elevation 1 mile north of Jamison Creek and 2.5 miles west of Tatlayoko Lake.
CLAIMS: FLY 1 to 14.
ACCESS: By helicopter from Williams Lake, approximately 100 miles.
OWNER: VANCO EXPLORATIONS LIMITED, Box 221, Commerce Court Postal Station, Commerce Court East, Toronto, Ont.
DESCRIPTION: Quartz diorite intrudes andesitic volcanic rocks.
WORK DONE: Trenching, 70 feet on Fly 4.

BU (No. 163, Fig. C)

LOCATION: Lat. 51° 44 - 46' Long. 124° 37.5'-39' (92N/10E)
CLINTON M.D. At approximately 6,000 feet elevation in the Niut Range on Butler Creek, 4 miles east-southeast of Bluff Lake.
CLAIMS: BU 1 to 112.
ACCESS: By helicopter from Kleena Kleene, 18 miles.
OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.
METALS: Copper, molybdenum.
DESCRIPTION: Small amounts of chalcopyrite and molybdenite are found in a zone of weakly to moderately altered intrusive and volcanic rocks. The intrusive rocks are mostly quartz diorite and the alteration of them is kaolinization of plagioclase and chloritization of the mafic minerals. The volcanic rocks are mainly andesite tuffs and the alteration, quartz and epidote. Up to 10 per cent pyrite-pyrrhotite is associated with the quartz-epidote alteration. Chalcopyrite is present in both rock types as fracture fillings and disseminations. Molybdenite occurs only as fine-grained accumulations in quartz veins in the intrusive rocks. Three

northwest-trending faults cross the property.

WORK DONE: Surface geological mapping, 1 inch equals one-half mile covering 39 BU claims and 1 inch equals 400 feet covering 13 BU claims; electormagnetic survey, 8.5 line miles covering Bu 3, 5, 7, 19, 21-26, 74, and 76; induced polarization survey, 7.9 line-miles covering BU 3, 5, 19-26, 78; geochemical soil survey, 219 samples covering BU 1, 3-6, 19-26, 74, 76, and 78.

MO (No. 164, Fig. C)

LOCATION: Lat. 51° 38' Long. 125° 02' (92N/10W, 11E)
CLINTON M.D. At approximately 7,000 feet in the Pantheon Range, 3 miles southwest of the south end of Middle Lake.

CLAIMS: MO 1 to 83, MO 82 and 100 Fractions.

ACCESS: By helicopter from Kleena Kleene, 23 miles.

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.

METALS: Copper, molybdenum, lead, zinc.

DESCRIPTION: The oldest rocks seen on the MO claim group are andesite, basalt, and tuff which now form roof pendants in later intrusive rocks which are: (1) quartz diorite, possibly part of a batholith, (2) a monzonite stock, (3) diorite and andesite, (4) a large number and variety of felsite dykes associated with the quartz monzonite. The mineralization found seems to be associated with the quartz monzonite. Pyrite, chalcopyrite, molybdenite, galena, sphalerite, molybdate, malachite, and azurite were found.

WORK DONE: Surface geological mapping, 1 inch equals one-half mile covering MO 1-16, 82, and 83.

MOUNTAIN BOSS (No. 165, Fig. C)

LOCATION: Lat. 51° 49.5' Long. 125° 04.8' (92N/14E)
CARIBOO M.D. At approximately 7,000 feet elevation 1.5 miles northeast of Perkins Peak, 22 miles west-southwest of Tatla Lake Post Office.

CLAIMS: Mineral Lease M-26 comprising BRITON, BELCHOR 1 to 8, IRON CROWN NO. 7, MONARCH, HEATHER, BLUE BELL (Lots 1062 to 1071, 1076, 1083, 1084) and APEX 1 to 54 located claims.

ACCESS: By road from a point 4 miles east of Kleena Kleene Post Office, 21 miles.

OWNER: Kleena Kleene Gold Mines Ltd.

OPERATOR: HUNTER POINT EXPLORATION LTD., 1955 Creelman Avenue, Vancouver 9.

METALS: Gold, silver.

DESCRIPTION: Arsenopyrite stringers, veinlets, and patches occur in an extensive silicified zone in sedimentary rocks.

(92N/16W)

WORK DONE: Road construction, 2 miles (extention to drill stations northeast of Perkins Peak; trenching, 510 feet and stripping, 200 feet by 50 feet on Apex 4; surface diamond drilling, four holes totalling 1,100 feet on Apex 4.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 326.

CUMO (No. 166, Fig C)

LOCATION: Lat. 51° 52'-55' Long. 124° 15'-18.5' (92N/16W) CLINTON M.D. At approximately 5,000 feet elevation the group is centred 3.5 miles southeast of the east end of Eagle Lake and 14 miles east of Tatla Lake Post Office.

CLAIMS: CUMO 1 to 84.

ACCESS: Twleve miles by road from Highway 20 at a point 15 miles east of Tatla Lake.

OPERATOR: UNION MINIERE EXPLORATIONS AND MINING CORPORATION LIMITED, 200, 4299 Canada Way, Burnaby 2.

DESCRIPTION: Approximately 90 per cent of the property is covered by Pleistocene glacial drift and fine silt. Outcrops are quartz biotite gneiss and schist and some greenschist (Middle Jurassic ?). Quartz veins occur in gneiss and schist. Iron oxide staining is common.

WORK DONE: Surface geological mapping, 1 inch equals 800 feet covering all claims; magnetometer survey, 21 line-miles covering most of the claims; electromagnetic survey, 4.5 line-miles covering Cumo 1-8, 14, 16, 18, 20, 69 to 72; induced polarization and resistivity survey, 5 line-miles covering Cumo 1-8, 14, 16, 18, 20, 52, 61, 62, 69-72; geochemical soil, stream sediment, water, and rock survey, 888 samples covering most of the claim; road construction, 8.5 miles; surface diamond drilling, one hole totalling 198 feet 6 inches on Cumo 5.

REFERENCES: Assessment Reports 4072, 4073.

TASEKO LAKES 92O

HUD (No. 167, Fig. C)

LOCATION: Lat. 51° 10'-11' Long. 122° 33'-38' (92O/2E) CLINTON and LILLOOET M.D. At approximately 6,000 feet elevation on the north side of Poison Mountain between Churn Creek and Yalakom River.

CLAIMS: HUD 1 to 60.

ACCESS: By road from Lillooet, 60 miles.

OWNER: ASELO INDUSTRIES LTD., 401, 550 Burrard Street, Vancouver 1.

DESCRIPTION: A porphyry complex intrudes greywacke.

WORK DONE: Geochemical survey, 299 samples covering Hud 1-20.

REFERENCE: Assessment Report 4139.

MUGWUMP (No. 169, Fig. C)

LOCATION: Lat. 51° 04' Long. 122° 49' (92O/2W)
LILLOOET M.D. At approximatey 4,000 feet elevation on Relay Creek, 1.5 miles above Tyaughton Creek.
CLAIMS: MUGWUMP, MUGWUMP 1 to 14, MUGWUMP 1 to 6 Fractions, HONDA 1 to 6, WINDFALL 1 to 3 Fractions.
ACCESS: By road from Goldbridge, 25 miles.
OWNER: BALLINDERRY EXPLORATIONS LTD., 1030, 540 Fifth Ave. SW., Calgary, Alta.
METALS: Mercury, antimony.
DESCRIPTION: Cinnabar and stibnite occur in conglomerate.
WORK DONE: Trenching, 650 feet on Mugwump 2, 4, 7 and Mugwump 4 Fraction; surface diamond drilling, four holes totalling 327 feet on Mugwump 2 and 7.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 224.

A, B, C (No. 76, Fig. C)

LOCATION: Lat. 51° 07.8'-10.5' Long. 122° 51'-55' (92O/2W)
LILLOOET M.D. On Relay Creek, 8.5 miles above Tyaughton Creek.
CLAIMS: A 1 to 12, B 1 to 12, C 1 to 12.
ACCESS: By the Lillooet-Bralorne and Tyaughton Creek roads, then by four-wheel-drive vehicle road up Relay Creek, 9 miles.
OWNER: EDINA RESOURCES LTD., 1065 – 16th Avenue, West Vancouver.
METAL: Copper.
DESCRIPTION: Weak pyrite-chalcopyrite-chalcocite mineralization is associated with several exposures of highly altered, leached, oxidized quartz feldspar porphyry.
WORK DONE: Geological mapping; road construction, 9,000 feet.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 327; Assessment Report 3829.

X, Y, Z (No. 75, Fig. C)

LOCATION: Lat. 51° 10.5' Long. 122° 56.5' (92O/2W)
LILLOOET M.D. Between 5,000 and 6,000 feet on Relay Creek, 11 miles above Tyaughton Creek.
CLAIMS: X 1 to 12, Y 1 to 12, Z 1 to 12.
ACCESS: By the Lillooet-Bralorne and Tyaughton Creek roads, then by four-wheel-drive vehicle road up Relay Creek, 11 miles.
OWNER: HOME OIL COMPANY LIMITED and U.V. INDUSTRIES INC. (Sheba Syndicate), 202, 850 West Hastings Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Dykes or small stocks of biotite to hornblende diorite porphyry intrude Cretaceous sedimentary and intercalated volcanic rocks.
WORK DONE: Surface geological mapping, 1 inch equals 100 feet covering Y 4, 6, 8

(92O/3E)

and Z 3, 5, 7, 9; geochemical soil survey, 112 samples covering the same claims; surface diamond drilling, three holes totalling 1,000 feet on Y 4, 6, 8.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 327; Assessment Report 3830.

BJB (No. 74, Fig. C)

LOCATION: Lat. 51° 05.8' Long. 123° 11.5' (92O/3E)
CLINTON M.D. At approximately 7,500 feet elevation 1 mile southwest of Lorna Lake and 16 miles east-southeast of the south end of Taseko Lakes.

CLAIMS: LORN 1 to 71.

ACCESS: By floatplane from Vancouver 120 miles or by helicopter from Gold Bridge, 23 miles.

OWNER: COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 5.

METALS: Copper, molybdenum.

DESCRIPTION: The property is underlain by an intrusive stock of quartz monzonite composition which cuts andesitic volcanic rocks of probable Jurassic age.

WORK DONE: Surface geological mapping, 1 inch equals 500 feet covering all claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 182; Assessment Report 3850.

ROWBOTTOM (No. 170, Fig. C)

LOCATION: Lat. 51° 02.5' Long. 123° 22.5' (92O/3W)
CLINTON M.D. At approximately 6,500 feet elevation near the headwaters of Granite Creek, about 11 miles southeast of the south end of Taseko Lakes.

CLAIMS: NW 1 to 18, BILL 1 to 18.

ACCESS: By road from Williams Lake, 170 miles.

OWNER: Victor Mining Corporation Ltd.

OPERATOR: GRANITE MOUNTAIN MINES LTD., 470 Granville Street, Vancouver 2.

METALS: Copper, molybdenum.

DESCRIPTION: Chalcopyrite and molybdenite occur as coarse to fine disseminations and occasionally as fracture fillings in altered quartz diorite and siliceous dykes.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; surface diamond drilling, two holes totalling 1,002 feet on Bill 8.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 329.

EGGS **(No. 171, Fig. C)**

LOCATION: Lat. 51° 10.5' Long. 123° 40.2' (92O/4E)
CLINTON M.D. At approximately 5,200 feet elevation on Tchaikazan River, 4.5 miles west of Upper Taseko Lake.

CLAIMS: EGGS, SUGAR, PORK, BEANS, ONION 1 to 3, A 1 to 20.

ACCESS: By road from Williams Lake, 140 miles or by floatplane from Clinton, 90 miles.

OPERATOR: RIO TINTO CANADIAN EXPLORATION LIMITED, 615, 555 Burrard Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: Chalcopyrite and molybdenite occur as fracture fillings in dykes of porphyritic and biotitic diorite. Intrusive porphyritic granodiorite and feldspar porphyry of volcanic origin form the country rock and also carry varying amounts of chalcopyrite, molybdenite, and pyrite.

WORK DONE: Surface diamond drilling, five holes totalling 273 feet on Pork, A 13, Sugar, Eggs.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 329.

WET, DRY **(No. 73, Fig. C)**

LOCATION: Lat. 51° 06.0'-10.3' Long. 123° 55' - 124° 08.5' (92N/1E; 92O/4W)
Report on this property in section 92N/1E.

FISH LAKE **(No. 172, Fig. C)**

LOCATION: Lat. 51° 27.8' Long. 123° 37.5' (92O/5E)
CLINTON M.D. At approximately 4,800 feet elevation 1 mile northwest of Fish Lake and 7 miles north-northeast of the north end of Taseko Lake.

CLAIMS: BB, BJ, BF, etc., totalling approximately 100.

ACCESS: By road from Williams Lake, 130 miles.

OWNERS: Taseko Mines Limited and Quintana Minerals Corporation.

OPERATOR: QUINTANA MINERALS CORPORATION, 1215, 555 Burrard Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: A weakly differentiated quartz diorite stock intrudes Mesozoic volcanic rocks and sedimentary rocks and is overlain by Tertiary basalt. The stock is altered and mineralized with pyrite, chalcopyrite, bornite, and molybdenite. The deposit is of the porphyry copper type.

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 4,000 feet covering most claims; road construction, 1 mile; surface diamond drilling, three holes totalling 1,500 feet.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 213.

ML (No. 173, Fig. C)

LOCATION:	Lat. 51° 35' Long. 122° 49.5' (92O/10W) Between 4,900 and 5,700 feet elevation on Williams Creek, approximately 13 miles southeast of the Big Creek Post Office.
CLAIMS:	ML, totalling 70.
ACCESS:	By road from Williams Lake, 80 miles southwest.
OWNER:	PAN OCEAN OIL LTD., 1050 Three Calgary Place, 355 Fourth Avenue SW., Calgary, Alta.
METAL:	Copper.
DESCRIPTION:	Chalcopyrite occurs in granodiorites and monzonites of a Jurassic intrusive stock surrounded by Tertiary Chilcotin plateau basalts.
WORK DONE:	Surface diamond drilling, one hole totalling 161 feet on ML 176 Fraction.
REFERENCE:	*B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 329, 330.

BONAPARTE RIVER 92P

CP (No. 79, Fig. C)

LOCATION:	Lat. 51° 10.0' Long. 120° 15.0' (92P/1) KAMLOOPS M.D. On Fishtrap Creek, 6 miles west of Barriere at 3,000 to 4,000 feet elevation.
CLAIMS:	CP 13 to 16, 70 to 83, 88 to 99.
ACCESS:	By secondary road from Barriere, 6 miles.
OWNER:	CAMBRIDGE MINES, LIMITED, 420 Howe Street, Vancouver 1.
METAL:	Copper.
DESCRIPTION:	Chalcopyrite, pyrite, magnetite, and possibly some sulphide nickel mineralization occur in small plugs of pyroxenite which intrude greenstones and andesites and diorites of the Bonaparte batholith. A stock of white to pink monzonite outcrops east of Fishtrap Creek.
WORK DONE:	Surface geological mapping, 1 inch equals 400 feet covering CP 15, 16, 71, 73, 74, 76-82, 88, 90, 91; magnetometer survey, 20 line-miles covering same claims; electromagnetic surveys, 4.5 line-miles and 6 line-miles covering CP 73, 74, 76, 78, 80, 82, 83; geochemical soil survey, 720 samples covering same claims as geological mapping.
REFERENCES:	*B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 316 (PC); Assessment Report 3816 (line-cutting).

PAW, SAM, RANGER (No. 4, Fig. B)

LOCATION:	Lat. 50° 58' - 51° 00' Long. 121° 27.6'-32' (92I/13E, 14W; 92P/3W, 4E) Report on this property in section 92I/13E, 14W.

BELL (No. 118, Fig. C)

LOCATION: Lat. 51° 00.2'-02' Long. 121° 32.5'-33.5' (92P/4E)
CLINTON M.D. On the west side of Highway 97, 4.5 miles south-southeast of Clinton at 3,000 to 4,000 feet elevation.
CLAIMS: BELL 1 to 20.
ACCESS: Via Highway 97, 4.5 miles south from Clinton.
OPERATOR: PEYTO OILS LIMITED, 335, 805 Fifth Street SW., Calgary, Alta.
DESCRIPTION: No outcrops were seen on the property.
WORK DONE: A magnetometer survey on Bell 1-10, 12, and 14.
REFERENCE: Assessment Report 4027.

MEL (No. 77, Fig. C)

LOCATION: Lat. 51° 01.5'-05' Long. 121° 30'-33.5' (92P/4E)
CLINTON M.D. On Hart Ridge, seven-eighth of a mile southeast of Clinton between elevations of 3,100 and 4,600 feet.
CLAIMS: MEL 1 to 78.
ACCESS: By road from Clinton, 1 mile.
OWNER: ACROLL OIL & GAS LTD., 574 Calgary Place One, 330 Fifth Avenue SW., Calgary, Alta.
WORK DONE: Electromagnetic and magnetometer surveys covering 25 line-miles.
REFERENCE: Assessment Report 3582.

BD, VB (No. 117, Fig. C)

LOCATION: Lat. 51° 17'-20' Long. 121° 04'-07' (92P/6E)
CLINTON M.D. At approximately 3,300 feet elevation on Rayfield River, 13 miles east of 70 Mile House.
CLAIMS: BD, VB, BRUCE, DAN, JIM, totalling 60.
ACCESS: By gravel secondary road and bush road from 70 Mile House, 17 miles.
OPERATOR: SENATE MINING AND EXPLORATION LIMITED, 320, 355 Burrard Street, Vancouver 1.
METAL: Copper.
WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering BD 58-60, 62, 68, Dan 1, 2 Fraction, VB 2, 6; trenching, approximately 5,000 feet on BD 58, 60, 62, 73 and VB 6.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 218.

L, K (No. 104, Fig. C)

LOCATION: Lat. 51' 18.5' Long. 120° 06.3' (92P/8E)
KAMLOOPS M.D. On Newhykulston Creek, 2 to 3 miles east of the North Thompson River, 9 miles north of Barriere.
CLAIMS: L 1 to 46, K 1 to 32.
ACCESS: By road from Barriere, 11 miles.
OWNER: Kel-Glen Mines Ltd.

(92P/8E)

OPERATOR: DeKALB MINING CORPORATION, 635 Sixth Avenue SW., Calgary, Alta.

METALS: Copper, silver.

DESCRIPTION: Highly oxidized copper-silver sulphides occur in a 20-foot-wide shear zone in the Fennell Formation.

WORK DONE: Surface workings mapped; surface geological mapping, 1 inch equals 50 feet covering K 13 and 14; trenching, 200 feet on K 13 and 14; surface diamond drilling, 10 holes totalling 1,812 feet on K 13 and 14.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 313.

BC (No. 80, Fig. A)

LOCATION: Lat. 51° 20.7'-22.2' Long. 119° 55' - 120° 00' (82M/5W; 92P/8E)

Report on this property in section 82M/5W.

MARTHA (No. 108, Fig. C)

LOCATION: Lat. 51° 22.5'-24.5' Long. 120° 03'-05' (92P/8E)

KAMLOOPS M.D. At approximately 5,000 feet elevation on Cowell Creek, 3 miles southeast of Dunn Lake.

CLAIMS: MARTHA 1 to 32.

ACCESS: By road from North Barriere Lake, 8 miles.

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.

DESCRIPTION: Rocks are greenstone, chert, argillite, and hornblende diorite. Quartz veins up to one-half-inch wide contain pyrite and rare chalcopyrite. Fine-grained disseminated pyrrhotite also occurs.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet on Martha 5-16, 20; geochemical soil survey, 80 samples covering Martha 6, 8, 20, 22.

MOE (No. 107, Fig. C)

LOCATION: Lat. 51° 23.5'-25.5' Long. 119° 59' - 120° 01.5' (92P/8E; 82M/5W)

KAMLOOPS M.D. At approximately 7,000 feet elevation on Dunn Creek, 5 miles east of Dunn Lake.

CLAIMS: MOE 2, 4, 6, 8, 10, 12, 25-36, 49-62, 73, 75, 77, 79, 81-86.

ACCESS: By helicopter from Kamloops, 52 miles.

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.

METAL: Molybdenum.

DESCRIPTION: Molybdenite occurs in northwest-trending quartz veins in fine and medium-grained phases of the Baldy batholith.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Moe 25-27, 31, 52, 54, 56, 75, 77; geochemical soil survey, 546 samples covering

Moe 4, 6, 8, 12, 27-36, 51-60, 81, 83; trenching, 188 cubic yards on Moe 75 and 77.

GOLD HILL (No. 80, Fig. C)

LOCATION: Lat. 51° 25′ Long. 120° 06′ (92P/8E)
KAMLOOPS M.D. At an elevation of 2,690 feet 1 mile east of the south end of Dunn Lake, 7 miles north of Chu Chua.
CLAIMS: DAN 1 to 3, RAN 1 to 3.
ACCESS: By road and trail from Chu Chua.
OWNER: JOSEPH G. MURPHY, 914 – 39th Avenue NW., Calgary, Alta.
METALS: Silver, lead, zinc, gold.
DESCRIPTION: Mineralization occurs in quartz veinlets in greenstones of the Fennell Formation.
WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet.
REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1929, p. 225; Assessment Report 3600.

PEST (No. 81, Fig. C)

LOCATION: Lat. 51° 33.7′-35′ Long. 120° 02.3′-05′ (92P/9E)
KAMLOOPS M.D. At an elevation of approximately 4,000 feet at the headwaters of Rennie Creek, 5 miles south of Clearwater and 2 miles east of the North Thompson River.
CLAIMS: PEST 1 to 44.
ACCESS: By helicopter from Clearwater, 5 miles.
OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.
DESCRIPTION: Outcrop is sparse. The property is probably underlain by rocks of the Fennell Formation near the contact with the Baldy batholith.
WORK DONE: Electromagnetic survey, 5.3 line-miles and geochemical soil survey, 156 samples covering Pest 1-6, 12, 14, 16, 18, 27, 29, 31, 33, 37, and 38; road construction 3.1 miles (from microwave tower road to the claims).
REFERENCE: Assessment Report 3818.

SONJA (No. 106, Fig. C)

LOCATION: Lat. 51° 38.1′ Long. 120° 00.7′ (92P/9E)
KAMLOOPS M.D. At approximately 1,200 feet elevation on the south side of the North Thompson River, one-half mile east of the Clearwater railway station.
CLAIMS: SONJA 2, 7, 8.
ACCESS: By road from Clearwater, one-half mile.
OWNER: ROBERT J. FRANKS, Box 70, Vavenby.
METALS: Silver, lead, zinc, gold, copper.
DESCRIPTION: The country rocks include black phyllite, shale, and limestone. These

(92P/9E)

strata dip moderately to the east and are cut by a grey dyke 10 to 40 feet wide.

WORK DONE: Trenching, 1,000 square feet; stripping, 1,000 square feet, and surface diamond drilling, three holes totalling 1,000 feet on Sonja 2.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 230.

SANDS CREEK (No. 105, Fig. C)

LOCATION: Lat. 51° 40.1' Long. 120° 02.6' (92P/9E)
KAMLOOPS M.D. At approximately 1,700 feet elevation on Sands Creek, one-half mile west of the Clearwater River, 2 miles north of Clearwater station.

CLAIMS: RO 1 to 6, ROACH 11 to 16, 20, 22, 24 and ROACH 25 and 26 Fractions.

ACCESS: By road from Clearwater, 1 mile.

OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

METAL: Molybdenum.

DESCRIPTION: Molybdenum mineralization is found in quartz veins along the contact of granodiorite intruding Triassic or earlier sedimentary and volcanic rocks.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet; percussion drilling, three holes totalling 430 feet on RO 1, 3 and Roach 15.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1961, p. 51; *B.C. Dept. of Mines*, Bull. 9, p. 33; *Geol. Surv., Canada*, Sum. Rept., 1930, Pt. A, p. 153.

CP (No. 82, Fig. C)

LOCATION: Lat. 51° 38.5'-41' Long. 120° 12'-16' (92P/9)
KAMLOOPS M.D. Between 3,200 and 5,700 feet elevation on the southwest slope of Clearwater Peak, 8 miles west-northwest of Clearwater.

CLAIMS: CP 1 to 72.

ACCESS: By logging road from Clearwater, 8 miles.

OWNER: PAN OCEAN OIL LTD., 1050 Three Calgary Place, 355 Fourth Avenue SW., Calgary, Alta.

METAL: Copper.

DESCRIPTION: The property is underlain mainly by fine-grained andesites of the Fennell Formation. Minor pyrite and pyrrhotite occur in greenstone and very minor occurrences of chalcopyrite occur in quartz veins.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet and geochemical soil survey, 279 samples covering all claims.

REFERENCE: Assessment Report 3885.

PYCU, LV, FORT (No. 111, Fig. C)

LOCATION: Lat. 51° 29'-34' Long. 120° 20'-26' (92P/9W)
KAMLOOPS M.D. The claims encircle the UNITED and DEER claims at Deer Lake, 10 miles northwest of Little Fort.

CLAIMS: PYCU 1 to 42, LV 11 to 91, FORT 1 to 6.

ACCESS: By 6 miles of logging road north from Highway 24, 9.5 miles west of Little Fort.

OWNER: BARRIER REEF RESOURCES LTD., 1418, 355 Burrard Street, Vancouver 1.

DESCRIPTION: The property is underlain by thin-bedded andesitic tuff, massive porphyritic andesite flows, and medium-grained pyroxene diorite. The latter volcanic rocks contain from 1 to 10 per cent disseminated sulphides in the form of pyrite and pyrrhotite.

WORK DONE: Electromagnetic survey covering the central PYCU claims.

REFERENCE: Assessment Report 4028.

LAKEVIEW, RED (No. 110, Fig. C)

LOCATION: Lat. 51° 31.8' Long. 120° 22.9' (92P/9W)
KAMLOOPS M.D. Between Deer and Laurel Lakes, 10 miles northwest of Little Fort.

CLAIMS: UNITED 1 to 8, DEER 1 to 35. The old LAKEVIEW mine is located on UNITED 2, 300 feet southwest of Deer Lake. The mine area was covered by TC 38 and 40 during 1966 and 1967. The RED (also known as AURORA or NORA) showing is on DEER 20.

ACCESS: By 6 miles of logging road north from Highway 24, 9.5 miles west of Little Fort.

OWNER: United Copper Corporation Limited.

OPERATOR: CARIBOO SYNDICATE, 202, 850 West Hastings Street, Vancouver 1.

METALS: Copper, gold, silver, iron.

WORK DONE: Geological and magnetometer surveys covering all claims.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1930, p. 191; 1967, pp. 132, 133 (Kala, Red, and TC); *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 312 (Silver); 1971, p. 334 (Silver); Assessment Report 3945.

FL (No. 109, Fig. C)

LOCATION: Lat. 51° 33'-37' Long. 120° 21'-28' (92P/9W)
KAMLOOPS M.D. Between 4,500 and 5,000 feet elevation near Friendly Lake, 16 miles northwest of Little Fort.

CLAIMS: FL 1 to 149 (in part covers former RO claims).

ACCESS: By Highway 24 and logging road from Little Fort, 22 miles.

OPERATOR: IMPERIAL OIL LIMITED, 500 Sixth Avenue SW., Calgary, Alta.

METALS: Copper, lead.

DESCRIPTION: The area is underlain by Upper Triassic andesitic flows, breccias, and tuffs and interbedded argillite, siltstone, and limestone of the Nicola

Group, which is intruded by three leucogranite to leucosyenite stocks. Northeast and northwest block faulting is common. Overburden covers 80 to 90 per cent of the area.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet covering all claims; magnetometer survey and induced polarization survey covering central portion of claim group; geochemical soil survey, 1,144 samples covering all claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 304 (RO); Assessment Report 4025.

ANTICLIMAX (No. 112, Fig. C)

LOCATION: Lat. 51° 35.5′ Long. 120° 18.3′ (92P/9W)
KAMLOOPS M.D. Between 3,900 and 4,500 feet elevation approximately one-half mile northeast of the north end of Tintlhoten Lake, 12 miles north-northwest of Little Fort.

CLAIMS: MO 4, 6, 8, 10 to 18, 20 to 34, 39 to 42, SEVEN-UP, BLUE JAY, MOOSE, LUCKY STRIKE, GORDON 3, LOON, FLY, LUCKY, RUB.

ACCESS: By four-wheel-drive vehicle road from Little Fort, 17 miles.

OPERATOR: IMPERIAL OIL LIMITED, 500 Sixth Avenue SW., Calgary, Alta.

METAL: Molybdenum.

DESCRIPTION: A small granitic stock occupies a low hill in the centre of the property, surrounded by argillites and pyroxene andesites which have been altered to hornfels at their contact. The exterior of the stock is mapped as aplite and the interior as leucocratic quartz monzonite to granite in composition.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet and induced polarization and resistivity survey, 8.10 line-miles covering all claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, pp. 304-307; Assessment Reports 4137, 4139.

SO (No. 83, Fig. C)

LOCATION: Lat. 51° 37.0′ Long. 120° 31.2′ (92P/9W, 10E)
KAMLOOPS M.D. Between 4,500 and 5,500 feet elevation 3.5 miles northwest of Friendly Lake and 19 miles northwest of Little Fort.

CLAIMS: BOG, totalling 91.

ACCESS: By gravel road from a point 7 miles east of Bridge Lake on Highway 24.

OPERATOR: PRISM RESOURCES LIMITED, 805, 850 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Nicola volcanic rocks of Upper Triassic age are intruded by rocks ranging from leucogranite to leucosyenite. Chalcopyrite and chalcocite occur disseminated and in veins in monzonite.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims.

(92P/14)

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 304; Assessment Report 3900.

RIP (No. 113, Fig. C)

LOCATION: Lat. 51° 57.5' Long. 121° 14' (92P/14)
CLINTON M.D. At approximately 4,100 feet elevation 4 miles east-southeast of Peach Lake and 15 miles northeast of Lac la Hache.

CLAIMS: RIP 33, 35, 37, 39, 41, 43, 45, 47, 49 to 99 (in part a restaking of former TIM claims).

ACCESS: By gravel and dirt road from Forest Grove, 25 miles.

OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Disseminated pyrite and chalcopyrite mineralization is localized near the contact of volcanic rocks and intrusive rocks.

WORK DONE: Road construction, one-quarter mile on Rip 95 and 96; percussion drilling, four holes totalling 700 feet on Rip 94 and 96.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 183 (Tim); Assessment Report 1131.

POP (No. 115, Fig. C)

LOCATION: Lat. 51° 48' Long. 121° 21' (92P/14W)
CLINTON M.D. Between Soda and Larsen Lakes, 5 miles east-southeast of Lac la Hache.

CLAIMS: POP 1 to 11 (a restaking of former SODA claims).

ACCESS: By paved and gravel road from Lac la Hache, 6 miles.

OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

DESCRIPTION: No outcrops occur on the claims. Percussion-drill holes intersected unmineralized Nicola volcanic rocks.

WORK DONE: Road construction, one-quarter mile on Pop 3; percussion drilling, two holes totalling 480 feet on Pop 3.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 217 (Soda); Assessment Report 2684.

WD (No. 87, Fig. C)

LOCATION: Lat. 51° 54'-56' Long. 121° 23'-25' (92P/14W)
CLINTON M.D. At approximately 3,700 feet elevation between Timothy and Rail Creeks, 8 miles north-northeast of Lac la Hache.

CLAIMS: WD 1 to 28 (mostly a restaking of FF claims).

ACCESS: By gravel road from Lac la Hache, 11 miles.

OWNER: AMAX EXPLORATION, INC., 601, 535 Thurlow Street, Vancouver 5.

DESCRIPTION: Claims cover a magnetic high in an area of few exposures. Nicola Group rocks occur outside the magnetic high.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; ground magnetometer survey, 12 line-miles covering all claims; high power induced polarization survey, 1.75 line-miles covering WD 11, 13, 15, 20, 22, 24; geochemical soil survey, 322 samples covering all claims.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1966, p. 135 (FF); 1967, p. 126 (FF); Assessment Report 3817.

WB (No. 116, Fig. C)

LOCATION: Lat. 51° 58' Long. 121° 27' (92P/14W)
CLINTON M.D. At approximately 3,700 feet elevation 2 miles northeast of Rail Lake and 10 miles north of Lac la Hache.

CLAIMS: WB 2, 4, 6, 8, 10, 12 to 16, 18, 20, 22, 24, 26, 28 to 32.

ACCESS: By gravel road from Lac la Hache, 16 miles.

OWNER: AMAX EXPLORATION, INC., 601, 535 Thurlow Street, Vancouver 5.

DESCRIPTION: Claims cover a magnetic high in an overburden-covered area.

WORK DONE: Helicopter-borne magnetometer survey, 75 line-miles covering all claims.

REFERENCE: Assessment Report 3882.

WC (No. 89, Fig. C)

LOCATION: Lat. 51° 57' - 52° 01' Long. 121° 20'-26' (92P/14W, 93A/3W)
CLINTON and CARIBOO M.D. Between 3,550 and 3,750 feet elevation straddling the north and south sides of Spout Lake, 13 miles north of Lac la Hache.

CLAIMS: WC 1 to 60, 64 to 68, 74 to 76, 90 to 132, 135 to 141, 146, 147, 192 to 197, 205, 206, WC 198 and 204 Fractions.

ACCESS: By gravel road from Lac la Hache, 19 miles.

OWNER: AMAX EXPLORATION, INC., 601, 535 Thurlow Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: Several skarn-type copper mineralized zones with associated magnetite occur in Nicola Group sedimentary rocks and basaltic breccias adjacent to a large monzonite stock.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet covering WC 22, 24, 26, 35, 37, and 39 and 1 inch equals 400 feet covering WC 9-13, 97-106, 110, 112, 114, 123-131, 139, 141; helicopter-borne magnetomter survey, 410 line-miles covering all claims; ground magnetometer survey, 6 line-miles covering WC 97-106, 112, 114, 123, 131, 139, 141; battery induced polarization survey, 10 lines-miles covering WC 9-12, 22, 24, 26, 32-40, 48-50, 98, 100, 103, 125, 127, 128; high power induced polarization survey, 7 line-miles covering WC 22, 24, 26, 30, 34, 35, 37, 39, 45, 49, 50, 52, 64, 66, 68, 97, 98, 100, 127; geochemical soil survey, 330 samples covering WC 97-106, 112, 114, 123, 131, 139, 141; road construction, three-quarters of a mile on

(92P/14W)
WC 24, 26, 37, 39, 51 plus 3 miles refurbished; surface diamond drilling, six holes totalling 434 feet on WC 24 and 26; percussion drilling, 10 holes totalling 2,767 feet on WC 24, 26, and 37.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 335; Assessment Reports 3881, 3882, 3883, 4029.

PEACH, PIT (No. 88, Fig. C)

LOCATION: Lat. 51° 57'-59.5' Long. 121° 17'-20' (92P/14W)
CLINTON M.D. Between 3,600 and 4,900 feet elevation south and southeast of Peach Lake, 13 miles north-northeast of Lac la Hache.

CLAIMS: PEACH 44, 46, 48, 50, 59 to 68, 73, 74, 77 to 90, 161, 163, 165, 215, 216, 230, PEACH 211 and 212 Fractions, PIT 5 to 17, 23, 26, 28, 30, 58 to 62, 67, 69 to 71, WC 170 to 173, 181 to 189, WC 190 and 191 Fractions.

ACCESS: By gravel road from Lac la Hache, 20 miles.

OWNERS: Amax Exploration, Inc. and Coranex Limited.

OPERATOR: AMAX EXPLORATION, INC., 601, 535 Thurlow Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: Several porphyry-type copper showings are associated with contacts of an alkalic intrusive complex emplaced into Nicola Group volcanic and sedimentary strata.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; induced polarization survey, 4 line-miles covering WC 172, Peach 65-68, and Peach 211 Fraction; helicopter-borne magnetometer survey covering all claims; geochemical soil survey, 559 samples covering 7 WC, 14 Pit, and 25 Peach claims; road construction, 1.75 miles; percussion drilling, 12 holes totalling 3,440 feet on Peach 66-68, 80, 87, 165, and 211 Fraction.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1968, pp. 155-159; *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 183; Assessment Reports 3815, 3882.

STAN, FIR (No. 86, Fig. C)

LOCATION: Lat. 51° 47.5' Long. 121° 10.5' (92P/14E)
CLINTON M.D. Between 3,300 and 3,500 feet elevation near Spring Lake and Lake of the Trees, 11 miles north-northeast of 100 Mile House.

CLAIMS: STAN 3 to 6, FIR 1 to 24, SKULL 1 to 18, BRETT 1 to 8, MAC 1 to 5.

ACCESS: By road from 100 Mile House.

OWNER: CANWAY EXPLORATIONS LTD., 12042 – 56th Avenue, Surrey.

METAL: Copper.

DESCRIPTION: Granodiorite occurs in contact with Nicola volcanic and sedimentary rocks.

(92P/14E)

WORK DONE: Induced polarization survey, 7 line-miles covering Fir 1, 2, 9, 10, 22-24, Brett 1, 4, 7, 8, and Skull 11, 13; road construction, 2 miles (along east shore of Spring Lake); stripping, 11,000 square feet on Fir 1 and 2; rotary drilling, one hole totalling 106 feet on Stan 4.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 334; Assessment Report 3657.

TIM (No. 114, Fig. C)

LOCATION: Lat. 51° 56.5′ Long. 121° 15.0′ (92P/14E)
CLINTON M.D. Four miles southeast of Peach Lake and 13 miles northeast of Lac la Hache.

CLAIMS: TIM 69 to 74, 76.

ACCESS: By gravel road 10 miles eastward from the Lac la Hache-Spout Lake road, from a point 2 miles south of Spout Lake.

OWNER: AMAX EXPLORATION, INC., 601, 535 Thurlow Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: The Tim claims are underlain by an indicated moderately to steeply northeast-dipping sequence of Nicola volcanic rocks which is locally intruded by syenodiorite intrusive (?) breccia bodies and by northeast or northwest-trending syenodiorite dykes. Copper mineralization occurs as disseminations and in vein and fracture stockworks spatially related to shear zones and syenodiorite dykes.

WORK DONE: A geological survey and a helicopter-borne magnetometer survey.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 183; Assessment Reports 3882, 4030.

BEER (No. 85, Fig. C)

LOCATION: Lat. 51° 52.8′ Long. 120° 51′ (92P/15W)
CLINTON M.D. At 3,000 feet elevation north of Canim Lake, 24 miles northeast of 100 Mile House.

CLAIMS: BEER 1 to 8.

ACCESS: By gravel road from 100 Mile House.

OWNER: ARAGON EXPLORATIONS LTD., 1763 East Hastings Street, Vancouver 6.

METAL: Copper.

DESCRIPTION: The claims are underlain by volcanic and sedimentary rocks of the Nicola Group.

WORK DONE: Geochemical soil survey, 117 samples during 1971.

REFERENCE: Assessment Report 3547;

NOD (No. 147, Fig. C)

LOCATION: Lat. 51° 54.5′ Long. 120° 55.5′ (92P/15W)
CLINTON M.D. At approximately 3,000 feet elevation immediately north of Roger Lake, 3 miles northwest of Eagle Creek.

(102I/9E, 16E; 92L/13W)

CLAIMS: JULY 1 to 34.

ACCESS: By road from 100 Mile House, approximately 30 miles.

OWNER: UTAH MINES LTD., 412, 510 West Hastings Street, Vancouver 2.

METAL: Copper.

DESCRIPTION: Copper mineralization occurs in syenitic dykes which intrude a contact breccia zone between granitic and metavolcanic rocks. The metavolcanic rocks are believed to belong to the Nicola Group, while the granitic rocks belong to the Takomkane batholith.

WORK DONE: Surface geological mapping, 1 inch equals 500 feet; ground magnetometer survey, 14.5 line-miles; and geochemical soil survey, 341 samples covering all claims.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 336 (Nod).

CAPE SCOTT 102I

ELK (No. 55, Fig. C)

LOCATION: Lat. 50° 44.5'-51' Long. 127° 59.5' - 128° 06.5'

(102I/9E, 16E; 92L/13W)

NANAIMO M.D. From 2 miles southeast of Knob Hill to Northwest Nipple.

CLAIMS: ELK, totalling 280.

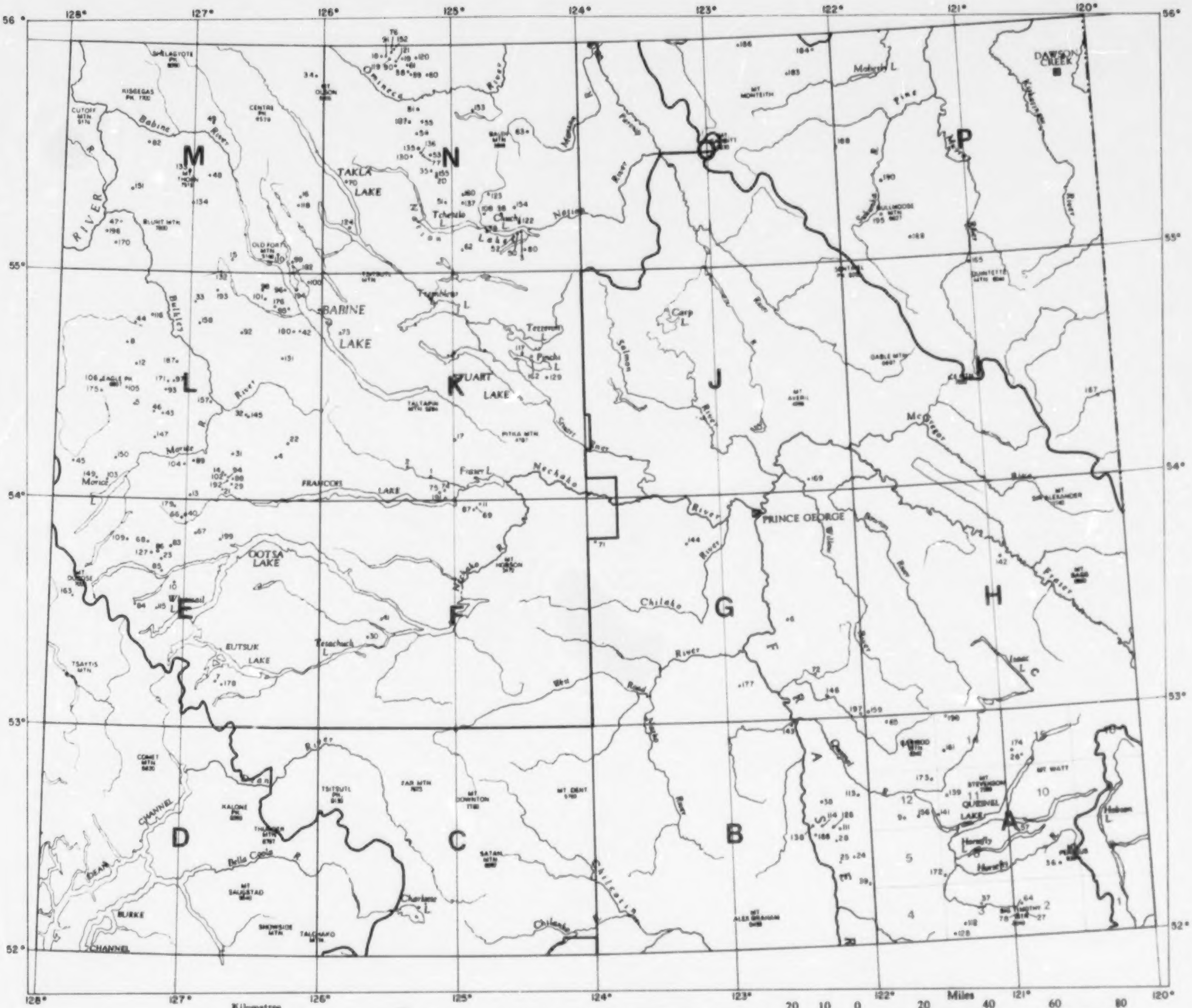
ACCESS: By from Holberg, 6 miles thence 5 miles on foot.

OWNER: Cominex Holdings Ltd.

OPERATOR: WEST COAST MINING & EXPLORATION, 205, 122 East 14th Street, North Vancouver.

DESCRIPTION: The claims are located at the contact between Bonanza volcanic rocks, Parson Bay sedimentary rocks, and Island Intrusions. Lower Cretaceous sedimentary rocks underlie the southwest part of the property.

WORK DONE: Surface geological mapping, 1 inch equals 800 feet; magnetometer survey, 150 line-miles; electromagnetic survey, 20 line-miles; geochemical rock survey, 90 samples; surface diamond drilling, four holes totalling 3,170 feet on ELK 27, 31, 34, 399.



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FRANCOIS LAKE
OOTSA LAKE
EUTSUK LAKE
QUESNEL LAKE
PRINCE GEORGE
DAWSON CREEK
Babine River
Omineca River
Nation River
Morice L
Nechako R
Fraser R
Chilako River
Blackwater River
Chilcotin
Bella Coola R
DEAN CHANNEL
BURKE CHANNEL
Tesachuck L
Tchentlo L
Trembleur L
Tezzeron L
Pinchi L
Carp L
Salmon River
McGregor River
Isaac L
Hobson L
Horsefly
Charlotte L
Moberly L
Pine River
Kiskatinaw River
Kilometres
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Miles
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10
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20
40
60
80

Figure D. INDEX MAP TO PROPERTIES IN NTS GRID DIVISION 93

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EAST CENTRAL BRITISH COLUMBIA
(NTS Division 93 Figure D)

QUESNEL LAKE 93A

MONTY (No. 78, Fig. D)

LOCATION: Lat. 52° 05′ Long. 120° 58′ (93A/2W)
CARIBOO M.D. On Boss Creek, 2.5 miles southwest of Big Timothy Mountain and 26 miles southeast of Horsefly.

CLAIMS: MONTY 1 to 60.

ACCESS: By helicopter from Horsefly, 26 miles.

OWNER: RIO TINTO CANADIAN EXPLORATION LIMITED, 615, 555 Burrard Street, Vancouver 1.

WORK DONE: Geochemical soil survey, 260 samples covering all claims.

BOSS MOUNTAIN MINE (No. 27, Fig. D)

By E. Sadar

LOCATION: Lat. 52° 05.9′ Long. 120° 54.4′ (93A/2W)
CARIBOO M.D. The mine is located at the headwaters of Molybdenite Creek on the east slope of Takomkane Mountain, about 6 miles west of Hendrix Lake.

CLAIMS: Ninety-nine claims including 11 Crown grants.

ACCESS: By gravel road from 100 Mile House for 52 miles to Hendrix Lake, then 6 miles west to the mine.

OWNER: NORANDA MINES, LIMITED (Boss Mountain Division), Hendrix Lake.

METAL: Molybdenum. (Production shown on Table I).

DESCRIPTION: Molybdenite mineralization occurrences are present in breccia stocks and stringers in granodiorite.

WORK DONE:

The mine is developed from a 5,000-foot adit roughly 500 feet below surface. In addition, an internal shaft has been sunk for 875 feet below the adit level to develop orebodies there. Although production was suspended on December 3, 1971, a limited amount of exploration work and development continued.

Approximately 23 persons were employed; 3,557 feet of development drifts and raises was driven; and 11,671 feet of diamond drilling was completed.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 210, 211.

TROOPER (No. 64, Fig. D)

LOCATION: Lat. 52° 08.5′ Long. 120′ 57′ (93A/2W)
CARIBOO M.D. On the north slope of Takomkane Mountain, 3 miles northwest of the Boss Mountain mine and 50 miles east of Williams Lake.

(93A/3E)

CLAIMS: TROOPER 1 to 18.
ACCESS: By road from Williams Lake to within 4 miles of the claim group.
OWNERS: C. E. MOORE, F. KRATZER, and V. COLEMAN, Box 1686, Williams Lake.
WORK DONE: Line-cutting; induced polarization survey, 5.2 line-miles covering Trooper 1-6 and 11-18; blasting on Trooper 7 and 8.
REFERENCE: Assessment Report 3886.

TRI (No. 37, Fig. D)

LOCATION: Lat. 52° 07.5′-09′ Long. 121° 11′-16′ (93A/3E)
CARIBOO M.D. On Moffat Creek, 6 miles north of Murphy Lake and 48 miles east of Williams Lake.
CLAIMS: TRI 13 to 91, 106, 151 to 180.
ACCESS: By gravel road from Williams Lake.
OWNER: GREEN LAND MINING LTD., 475 Howe Street, Vancouver 1.
WORK DONE: Geochemical soil survey covering Tri 151-180.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 129; Assessment Report 3876.

WC (No. 89, Fig. C)

LOCATION: Lat. 51° 57′ - 52° 01′ Long. 121° 20′-26′ (92P/14W; 93A/3W)
Report on this property in section 92P/14W.

WA (No. 128, Fig. D)

LOCATION: Lat. 52° 02.5′ Long. 121° 26′ (93A/3W)
CARIBOO M.D. Two miles north of the west end of Spout Lake and 21 miles east-southeast of 150 Mile House.
CLAIMS: WA 1 to 16.
ACCESS: The property straddles the Lac la Hache-Murphy Lake road, 20 miles north of Lac la Hache.
OWNER: AMAX POTASH LIMITED, 601, 535 Thurlow Street, Vancouver 5.
WORK DONE: Helicopter-borne magnetometer survey, 54 line-miles covering all claims.
REFERENCE: Assessment Report 3882.

BORY (No. 112, Fig. D)

LOCATION: Lat. 52° 02.8′-06′ Long. 121° 17.2′-27.5′ (93A/3W)
CARIBOO M.D. At approximately 3,000 feet elevation north and west of Murphy Lake, 18 miles north of Lac la Hache.
CLAIMS: BORY 1 to 138, 143 to 234.
ACCESS: By road from Lac la Hache, 18 miles.
OWNER: WESFROB MINES LIMITED, 500, 1112 West Pender Street, Vancouver 1.

(93A/6W)

METAL: Copper.

DESCRIPTION: The claims are underlain by quartz monzonite and granodiorite of Jurassic and/or Cretaceous age with chalcopyrite in veinlets and disseminations.

WORK DONE: Rotary drilling, six holes totalling 2,018 feet on Bory 123, 126, 138, 195, and 196.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 130.

RED (No. 172, Fig. D)

LOCATION: Lat. 52° 18' Long. 121° 27' (93A/6W)
CARIBOO M.D. On Moffat Creek, 3 miles south of Horsefly.

CLAIMS: RED 1 to 16.

ACCESS: By road from Horsefly, 3 miles.

OWNER: VANCO EXPLORATIONS LIMITED, Box 221, Commerce Court Postal Station, Commerce Court East, Toronto, Ont.

DESCRIPTION: Native copper occurs in basalt flows.

WORK DONE: Trenching on Red 6.

P (No. 57, Fig. D)

LOCATION: Lat. 52° 27.5' Long. 120° 54' (93A/7W)
CARIBOO M.D. On Horsefly Lake, northwest of Suey Bay.

CLAIMS: P 1 to 20.

ACCESS: By road from Horsefly, 25 miles.

OWNER: NORTHWIND MINES LTD., 440, 890 West Pender Street, Vancouver 1.

WORK DONE: Line-cutting on P 9-16.

REFERENCE: Assessment Report 4188.

CS, EN (No. 36, Fig. D)

LOCATION: Lat. 52° 18.8' Long. 120° 37.4' (93A/7E)
CARIBOO M.D. At elevations of 5,000 to 7,900 feet between Crooked Lake and MacKay River, 70 miles east of Williams Lake.

CLAIMS: CS, EN, SEB, AUG, totalling 46.

ACCESS: By secondary and bush road from Horsefly, 40 miles.

OWNER: E. Scholtes.

OPERATOR: RIO TINTO CANADIAN EXPLORATION LIMITED, 615, 555 Burrard Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: A complex intrusive sequence of amphibolite-diorite-syenodiorite contains chalcopyrite and pyrite in disseminations and fracture fillings. Strong potassic-sericite alteration coincides with the copper mineralization, and is surrounded by a chlorite-epidote alteration.

WORK DONE: Surface geological mapping, 1 inch equals 500 feet covering EN 11-15,

28, 29, 104-107, 109, 126, 127, 129 and CS 55 and 56.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 211; Assessment Report 3814.

PROVIDENCE (No. 139, Fig. D)

LOCATION: Lat. 52° 38.5′ Long. 121° 25′ (93A/11W)
CARIBOO M.D. On China Mountain, between Blackbear and Collins Creeks, 6.5 miles east-northeast of Likely.
CLAIMS: BG 1 to 20, 22 to 38.
ACCESS: By road from Likely.
OWNER: D. G. LEIGHTON, c/o 713, 744 West Hastings Street, Vancouver 1.
METALS: Silver, lead.
DESCRIPTION: Mineralization occurs in quartz veins in argillite of the Midas Formation.
WORK DONE: Geochemical soil survey, 410 samples.
REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1967, p. 124; Assessment Report 3944.

MANX (No. 141, Fig. D)

LOCATION: Lat. 52° 33′ Long. 121° 30′ (93A/11W, 12E)
CARIBOO M.D. On Cedar Creek, 4 miles from Likely.
CLAIMS: MANX 1 to 8.
ACCESS: By dirt road from Likely.
OWNER: CEDAR CITY MINES LTD., 428, 470 Granville Street, Vancouver 2.
WORK DONE: Line-cutting.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 134; Assessment Report 3943.

WP (No. 9, Fig. D)

LOCATION: Lat. 52° 33.2′ Long. 121° 45′ (93A/12E)
CARIBOO M.D. Between Little and Morehead Lakes, 1 mile west of Hydraulic.
CLAIMS: WP 1 to 20.
ACCESS: By road from Likely, 7 miles.
OWNER: BURDOS MINES LTD., 515, 602 West Hastings Street, Vancouver 2.
WORK DONE: Line-cutting.
REFERENCE: Assessment Report 3564.

CARIBOO-BELL (No. 156, Fig. D)

LOCATION: Lat. 52° 33.5′ Long. 121° 38.5′ (93A/12E)
CARIBOO M.D. At approximately 3,200 feet elevation on Mount Polley between Bootjack and Polley Lakes, 5 miles northwest of Likely.

CLAIMS: BJ, BOOTJACK, RED, BLUE, HAZE, HOT, totalling 310.

ACCESS: By road from Williams Lake, 57 miles.

OWNER: CARIBOO-BELL COPPER MINES LIMITED, 700, 1177 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The Mount Polley stock is extensively mineralized with chalcopyrite, particularly in the breccia zones.

WORK DONE: Geochemical soil survey, 95 samples covering BJ 51, 57, 58, 63, and 65; percussion drilling, 17 holes totalling 4,185 feet on BJ 1, 9, 17, 58. 60, 63, 118, and 120.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 135.

HL, ZL (No. 173, Fig. D)

LOCATION: Lat. 52° 42'-43.3' Long. 121° 30'-33.5' (93A/12E)
CARIBOO M.D. On Ditch Creek, 2 miles south of Rollie Lake and 7 miles north of Likely.

CLAIMS: HL 1 to 24, ZL 1 to 24, LAM 1 to 8.

ACCESS: By road from Likely, 10 miles.

OPERATOR: CREAM SILVER MINES LTD., c/o 1575 Rena Crescent, West Vancouver.

DESCRIPTION: The claims are underlain by Cunningham limestone of Lower Cambrian age.

WORK DONE: Surface geological mapping, 1 inch equals 2,000 feet covering all claims; geochemical survey, 143 samples covering Lam 1-3, 5, and 7; trenching, 1,763 cubic feet on Lam 2 and 5.

SOVEREIGN (No. 65, Fig. D)

LOCATION: Lat. 52° 56' - 53° 00' Long. 121° 47.5'-54.2' (93A/13W)
CARIBOO M.D. At approximately 4,000 feet elevation straddling Sovereign and Reddish Creeks, about 30 miles east of Quesnel.

CLAIMS: SOVEREIGN, TRIFAUX, LOUISE, DON, totalling 70.

ACCESS: By road from Quesnel, 30 miles.

OPERATOR: SELCO MINING CORPORATION LIMITED, 6th Floor, 55 Yonge Street, Toronto, Ont.

METAL: Nickel.

DESCRIPTION: Nickel mineralization occurs in an ultrabasic intrusion.

WORK DONE: Geochemical survey, approximately 400 soil, stream sediment, and rock samples covering all claims.

PARK (No. 161, Fig. D)

LOCATION: Lat. 52° 55'-57' Long. 121° 20'-22' (93A/14W)
CARIBOO M.D. At 2,600 to 3,500 feet elevation near the headwaters of Antler Creek, between Nugget and Roundtop Mountains, 16 miles southeast of Barkerville.

(93A/15W)

CLAIMS: PARK, BON, ROUNDTOP, RT, TAB, SILVER MT., BASE METAL, totalling 142.
ACCESS: By the Yanks Peak road from Barkerville, 13 to 15 miles.
OWNER: COAST INTERIOR VENTURES LTD., 2801 – 18th Avenue, Vernon.
METALS: Gold, silver, lead, copper, zinc, tungsten.
DESCRIPTION: Mineralization occurs in quartz veins and in shears generally close to faults that cut members of the Snowshoe and Midas Formations.
WORK DONE: Stripping, approximately 1,575 cubic yards on Bon 60, 62, 63, 65 and RT 41, 44; surface diamond drilling, 11 holes totalling 1,890 feet on Roundtop 10 and 28.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 136.

SIL (No. 26, Fig. D)

LOCATION: Lat. 52° 47.7' Long. 120° 51' (93A/15W)
CARIBOO M.D. Approximately 4 miles west of Maeford Lake and 70 miles northeast of Williams Lake.
CLAIMS: SIL 1 to 28, WART 1.
ACCESS: By helicopter from Williams Lake, 70 miles.
OPERATOR: CANADIAN SUPERIOR EXPLORATION LIMITED, 5, 465 Victoria Street, Kamloops.
METALS: Lead, zinc.
DESCRIPTION: Mineralization occurs in Cunningham limestone.
WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Sil 1-28; induced polarization survey, 10 line-miles covering Sil 10, 13, 14 and Wart 1; geochemical soil survey, 337 samples covering all claims; surface diamond drilling, three holes totalling 1,500 feet on Sil 13 and Wart 1.
REFERENCES: Assessment Reports 2366 (LR), 3783, 3813.

AI (No. 174, Fig. D)

LOCATION: Lat. 52° 49' Long. 120° 56' (93A/15W)
CARIBOO M.D. At approximately 5,000 feet elevation 3 miles northeast of Maeford Lake and 6 miles northwest of the north arm of Quesnel Lake.
CLAIMS: AI 1 to 38.
ACCESS: By helicopter from Williams Lake, 70 miles.
OWNER: REMAR RESOURCES LTD. (formerly Morocco Mines Ltd.), 211, 850 West Hastings Street, Vancouver 1.
METALS: Silver, lead, zinc.
DESCRIPTION: Galena, sphalerite, chalcopyrite, and pyrite occur in metamorphosed limestone.
WORK DONE: Trenching, 184 feet on AI 11, 12, and 13.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 136.

KAREN (No. 39, Fig. D)

LOCATION: Lat. 52° 14.5'-17' Long. 122° 00'-02' (93B/1E, 8E) CARIBOO M.D. On Johnny Creek, 1 mile south of Forest Lake and 20 miles northeast of Williams Lake.

CLAIMS: KAREN 1 to 40.

ACCESS: By road from Williams Lake, 20 miles.

OPERATOR: MAGUS MINES LTD., 1650, 777 Hornby Street, Vancouver 1.

WORK DONE: Airborne magnetometer and electromagnetic surveys covering all claims.

REFERENCE: Assessment Report 3812.

IRON MOUNTAIN (BRENDA) (No. 28, Fig. D)

LOCATION: Lat. 52° 27.7' Long. 122° 15.4' (93B/8) CARIBOO M.D. At elevations of 3,000 to 3,500 feet 3 miles northeast of McLeese Lake.

CLAIMS: BRENDA, MAYDAY, TED, MAYBE, TELL, ANCHOR, JUNE, totalling 45.

ACCESS: By gravel road from McLeese Lake, 5 miles.

OWNER: Ensbrook Mines Ltd.

OPERATOR: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: Chalcopyrite and malachite occur sparsely disseminated in greenschist and in skarn lenses.

WORK DONE: Induced polarization survey, 21.5 line-miles covering Ted 1-6, Tell 1-4, Maybe 1-7, Mayday 1, 2, 9, 10, 13-15, and Brenda 1-5; electromagnetic survey, 28.4 line-miles covering the same claims plus Brenda 6 and 7; geochemical soil survey, 123 samples covering Tell 1-4, Maybe 1-6, Mayday 1-3, 5, 6, 9, 10, 14, 15, and Brenda 6 and 7; surface diamond drilling, nine holes totalling 2,631 feet on Ted 2, Maybe 1, 3, and Mayday 9, 14, 15.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1925, p. 156; 1956, p. 33; 1957, p. 16; Assessment Reports 296, 1873, 3746.

NICK, GAIL (No. 166, Fig. D)

LOCATION: Lat. 52° 28'-31.7' Long. 122° 21'-26' (93B/8W, 9W) CARIBOO M.D. At approximately 3,000 feet east of the Fraser River, 1.5 miles east of Marguerite and due north of McLeese Lake.

CLAIMS: GAIL 1 to 62, NICK 1 to 29.

ACCESS: By logging road from Marguerite, 2 miles.

OWNERS: LOWER VALLEY MINES LTD., ROCKY MOUNTAIN TRENCH MINES LTD., and WHITEY WILSON OIL & GAS LTD., c/o 201, 569 Howe Street, Vancouver 1.

DESCRIPTION: The claims are underlain by volcanic rocks of Tertiary age.

(93B/8, 9)

WORK DONE: Magnetometer survey, 28 line-miles and geochemical soil survey, 2,888 samples covering Gail and Nick claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 140; Assessment Report 4243.

HD (No. 111, Fig. D)

LOCATION: Lat. 52° 30.2' Long. 122° 13.6' (93B/8, 9)
CARIBOO M.D. At approximately 4,000 feet elevation 1 mile east of the south end of Granite Lake.

CLAIMS: HD, HA, HAS, LINDA, FFE, VE, FI, CAROL, SAP, totalling 48.

ACCESS: By the Gibraltar mine road from McLeese Lake, approximately 12 miles.

OWNER: Cuisson Lake Mines Ltd.

OPERATOR: GIBRALTAR MINES LTD., Box 130, McLeese Lake.

METALS: Copper, molybdenum.

DESCRIPTION: Chalcocite, chalcopyrite, and molybdenite occur in altered zones within quartz diorite.

WORK DONE: Trenching, 1,100 feet on Sap 4 Fraction.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 139.

MAR (No. 25, Fig. D)

LOCATION: Lat. 52° 21.8' Long. 122° 14.0' (93B/8E)
CARIBOO M.D. East of Duckworth Lake between Soda Creek and McLeese Lake.

CLAIMS: MAR 1 to 20.

ACCESS: By logging road from the town of McLeese Lake, 4 miles.

OWNER: GALVESTON MINES LTD., 355 Two Bentall Centre, Vancouver 1.

DESCRIPTION: The claims are underlain by sedimentary rocks of the Cache Creek Formation.

WORK DONE: Geochemical and magnetometer surveys.

REFERENCES: Assessment Reports 3703, 3811.

YVETTE (No. 24, Fig. D)

LOCATION: Lat. 52° 22.2'-23.4' Long. 122° 10.5'-12.4' (93B/8E)
CARIBOO M.D. Five miles southeast of McLeese Lake.

CLAIMS: YVETTE 1 to 18, YVETTE 19 to 22 Fractions.

ACCESS: By road from McLeese Lake, 5 miles.

OWNER: Henrietta Mines Ltd.

OPERATOR: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Yvette 2, 4, 8-10 and 20-22 Fractions; electromagnetic survey, 5.95 line-miles covering all claims.

REFERENCE: Assessment Report 3722.

PAT (No. 24, Fig. D)

LOCATION: Lat. 52° 23.2'-24.3' Long. 122° 10.5'-14.6' (93B/8E)
CARIBOO M.D. Five miles southeast of McLeese Lake, 9 miles south of Granite Mountain.
CLAIMS: PAT 1 to 50, PAT 51 to 54 Fractions.
ACCESS: By road from McLeese Lake, 5 miles.
OWNER: Mineral Mountain Mining Co. Ltd.
OPERATOR: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.
WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Pat 19-21, 28, 45-49 and Pat 52 and 53 Fractions; electromagnetic survey, 10.8 line-miles covering Pat 2-20, 22-27, 30, 47, 49 and Pat 53 Fraction; surface diamond drilling, two holes totalling 421 feet on Pat 32 and 34.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 139; Assessment Reports 3656, 3721.

ALM, RAM (No. 113, Fig. D)

LOCATION: Lat. 52° 38'-41' Long. 122° 05'-07' (93B/9E)
CARIBOO M.D. At approximately 2,000 feet elevation on Beaver Creek, 28 miles southeast of Quesnel.
CLAIMS: ALM 1 to 24, RAM 1 to 36.
ACCESS: By road from Quesnel, 33 miles.
OWNER: RAMTON MINING CORPORATION LTD., 710, 475 Howe Street, Vancouver 1.
DESCRIPTION: The claims are underlain by silicified and chloritized granodiorite.
WORK DONE: Geochemical survey, 1,500 samples covering all claims; trenching, approximately 1,250 cubic feet on Alm 10 and 12.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 141; Assessment Report 3993.

AXEL (No. 114, Fig. D)

LOCATION: Lat. 52° 32' Long. 122° 20.5' (93B/9W)
CARIBOO M.D. Surrounding Teakettle Lake, 5 miles west-northwest of Granite Mountain.
CLAIMS: AXEL, MAX, JIB, PET, MOOSE, HEM, DEER, REX, totalling approximately 40.
ACCESS: By road from McLeese Lake, 10 miles.
OWNER: AXEL MINES LTD., 700, 1177 West Hastings Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Diorite intrudes volcanic rocks; narrow zones of alteration and mineralization occur in the diorite.
WORK DONE: Magnetometer and electromagnetic surveys, 14 line-miles covering most of the claims.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 144.

(93B/9W)

MARG (No. 138, Fig. D)

LOCATION: Lat. 52° 32′ Long. 122° 23′ (93B/9W)
CARIBOO M.D. Three miles northeast of Marguerite.
CLAIMS: MARG 1 to 6.
ACCESS: By road from Marguerite.
OWNER: CANWEX EXPLORATIONS LTD., 1666 West Broadway, Vancouver 9.
WORK DONE: Geochemical survey during 1971.
REFERENCE: Assessment Report 3966.

GIBRALTAR MINE (No. 126, Fig. D)

By A. D. Tidsbury

LOCATION: Lat. 52° 31′ Long. 122° 17′ (93B/9W)
CARIBOO M.D. Between 3,900 and 4,000 feet elevation along Granite Creek and Granite Lake.
CLAIMS: PAN, ZEPHYR, GG, etc., totalling approximately 400.
ACCESS: Twelve miles from Highway 97 at McLeese Lake, by all-weather road to the minesite at Granite Lake.
OPERATOR: GIBRALTAR MINES LTD., Box 130, McLeese Lake.
METALS: Copper, molybdenum (production shown on Table I).
WORK DONE:

The mine officially began operations in March, 1972, and is presently being worked on a three-shift basis. Ore is being mined from the Gibraltar East pit. Material handled from March to the end of the year is as follows: overburden removal (by contractor), 4,038,000 tons; high-grade ore, 11,995,000 tons; low-grade ore, 5,211,000 tons; waste rock, 6,083,000 tons; overburden (by company), 3,154,000 tons.

Open-pit mining was carried out with the following equipment: three P&H 2100 electric shovels (14-cubic-yard buckets); two Bucyrus-Erie 45-R electric drills; fifteen M-100 Lectra Haul trucks; two M-85 Lectra Haul trucks; six Caterpillar tractors; two Caterpillar graders; and various other cranes, service vehicles, etc.

The concentrator utilizes both rod and ball mills, and has a nominal 30,000-tons-per-day rating. Throughput at the end of the year was 45,000 tons per day. A total of 10,861,500 tons of copper ore has been milled since start-up. From this ore, 122,774 tons of concentrate has produced 74,412,300 pounds of copper.

The molybdenite circuit was operated on a test basis only, and no molybdenite concentrate was marketed.

Pollution control permit standards for water have been bettered or equalled. The tailings pond is now a closed circuit, with seepage from the main dam being collected and pumped back into the circuit.

Thirty-seven acres of disturbed lands were aerially seeded in August. All areas previously seeded were refertilized from the air. Continued progress was maintained in clearing damaged and diseased trees from all road margins and clearing perimeters.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, pp. 163-173; 1971, p. 143.

(93B/9W)

SWEDE, MY (No. 38, Fig. D)

LOCATION: Lat. 52° 36.5'-38' Long. 122° 17.8'-23' (93B/9W)
CARIBOO M.D. On Moffat Creek, 4 miles east of Alexandria and 15 miles north-northeast of Marguerite.
CLAIMS: SWEDE, MY, totalling 98.
ACCESS: By secondary road from Marguerite, 15 miles.
OPERATOR: GRANITE MOUNTAIN MINES LTD., 330, 470 Granville Street, Vancouver 2.
WORK DONE: Induced polarization and resistivity survey.
REFERENCE: Assessment Report 3828.

WHITESAIL LAKE 93E

POND (No. 178, Fig. D)

LOCATION: Lat. 53° 11' Long. 126° 43.5' (93E/2E)
OMINECA M.D. At elevations of 3,500 to 6,500 feet south of Eutsuk Lake, 80 miles southwest of Burns Lake.
CLAIMS: POND, totalling 30.
ACCESS: By helicopter from Burns Lake.
OWNER: ADASTRAL MINING CORPORATION LTD., 801, 900 West Hastings Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Chalcopyrite occurs disseminated in andesite.
WORK DONE: Petrographic study and rock geochemistry.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 144; Assessment Report 4185.

JAM, BOB, RON (No. 7, Fig. D)

LOCATION: Lat. 53° 12' Long. 126° 45' (93E/2E)
OMINECA M.D. Between elevations of 3,000 and 6,500 feet on Mount Preston, 2 miles south of Eutsuk Lake and 80 miles southwest of Burns Lake.
CLAIMS: JAM, BOB, RON, IRENE, totalling 134.
ACCESS: By helicopter from Burns Lake, 80 miles.
OPERATOR: DENISON MINES LIMITED, 1705, 777 Hornby Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Chalcopyrite occurs disseminated in scoriaceous andesite close to contacts with friable red basalt.
WORK DONE: Geological mapping, 1 inch equals 800 feet on Jam 2 and Bob 5 and 7 during 1971.
REFERENCE: Assessment Report 3540.

FAB (No. 115, Fig. D)

LOCATION: Lat. 53° 31' Long. 127° 13' (93E/11E)
OMINECA M.D. Between elevations of 3,800 and 5,000 feet on the western tributary of Coles Creek, 6 miles south-southwest of the east end of Troitsa Lake, 65 miles south of Houston.

CLAIMS: FAB 1 to 11, 33 to 92.

ACCESS: By helicopter from Tahtsa Reach, 12 miles.

OWNER: AMAX POTASH LIMITED, 601, 535 Thurlow Street, Vancouver 5.

METALS: Copper, molybdenum.

DESCRIPTION: Chalcopyrite with minor molybdenite occurs in a quartz vein stockwork in proximity to a feldspar-biotite porphyry stock.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet, induced polarization survey, 7 line-miles, magnetometer survey, 7 line-miles, and geochemical soil survey, 234 samples covering Fab 41-46 and 60-67; surface diamond drilling, seven holes totalling 2,800 feet on Fab 45, 47, 59, and 64.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 145.

REA, TL (No. 10, Fig. D)

LOCATION: Lat. 53° 37.2'-40' Long. 127° 02.5'-07.5' (93E/11E)
OMINECA M.D. On the south shore of Tahtsa Lake near Kasalka Creek, 55 miles southwest of Houston.

CLAIMS: REA 1 to 30, 35 to 54, 57 to 115.

ACCESS: By road and boat from Tahtsa Landing, 7 miles.

OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum, silver.

DESCRIPTION: The claims are underlain by Jurassic volcanic and sedimentary rocks intruded by at least two small felsic stocks. The rocks are locally strongly pyritized and contain minor copper, molybdenum, and silver mineralization.

WORK DONE: Line-cutting and geochemical survey on Rea 13, 21-28, 30, 36-53, 57-60, 71, 72, 74, 89, 91-94, and 110-112 during 1971; road construction, 5 miles (from Kasalka Creek to central portion of claim block) and percussion drilling, eight holes totalling 1,490 feet on Rea 22-26, 40, 78, and 92 during 1972.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 97; Assessment Report 3576.

HIT (No. 23, Fig. D)

LOCATION: Lat. 53° 43.5'-45' Long. 127° 08.5'-11.5' (93E/11E)
OMINECA M.D. At approximately 5,000 feet elevation between Comb and Whiting Creeks, 1.5 miles southeast of Sibola Peak, 70 miles south of Houston.

(93E/11E)

CLAIMS: HIT, totalling 33.
ACCESS: By four-wheel-drive vehicle road from the forestry road, 3 miles.
OWNERS: J. Todd and R. R. Blusson.
OPERATOR: ALVIJA MINES LTD., 642 Clark Drive, Vancouver 6.
WORK DONE: Line-cutting in preparation for soil sampling.
REFERENCE: Assessment Report 3666.

LEN (HUCKLEBERRY) (No. 85, Fig. D)

LOCATION: Lat. 53° 41' Long. 127° 10' (93E/11E)
OMINECA M.D. At approximately 3,400 feet elevation near Huckleberry Mountain and Sweeney Lake.
CLAIMS: LEN 1 to 58, 60 to 84, 86, 88, 90, 92, 94, 96, 98, 100, BERRY 2 to 4 Fractions.
ACCESS: By road from Houston, 80 miles.
OWNER: Kennco Explorations, (Western) Limited.
OPERATOR: THE GRANBY MINING COMPANY LIMITED, 2000, 1055 West Hastings Street, Vancouver 1.
METALS: Copper, molybdenum.
DESCRIPTION: Pyrite, chalcopyrite, and molybdenite occur as fillings and disseminations in a quartz diorite stock and surrounding hornfelsed volcanic rocks.
WORK DONE: Claims mapped; surface diamond drilling, 18 holes totalling 9,282 feet on Len 4, 6, 17, and 19.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 145.

WHIT (No. 86, Fig. D)

LOCATION: Lat. 53° 45.5' Long. 127° 12.0' (93E/11E, 14E)
OMINECA M.D. Between 3,000 and 5,000 feet elevation on Whiting Creek, 2 miles north of Sweeney Lake.
CLAIMS: WHIT 1 to 100.
ACCESS: By road from Houston, 70 miles.
OWNER: Kennco Explorations, (Western) Limited.
OPERATOR: QUINTANA MINERALS CORPORATION, 1215, 555 Burrard Street, Vancouver 1.
METALS: Molybdenum, copper.
DESCRIPTION: Hazelton pyroclastic rocks are cut by quartz monzonite and leuco quartz porphyry stocks and smaller feldspar porphyry dish-like intrusions. There is widespread alteration accompanied by pyrite, chalcopyrite, and molybdenite mineralization.
WORK DONE: Geochemical rock survey covering most of the claims; surface diamond drilling, one hole totalling 1,500 feet.
REFERENCE: *Minister of Mines, B.C.*, Ann. Rept., 1965, p. 87.

DW, CORB, CUP, FEN (No. 127, Fig. D)

LOCATION: Lat. 53° 45.5' Long. 127° 42' (93E/11E, 14E)
OMINECA M.D. On the west shore of Nanika Lake, south of Fenton Creek, 70 miles southeast of Smithers.

CLAIMS: DW 1 to 14, CORB 1 to 55, 57 to 69, 71 to 80, CUP 1 to 12, 17 to 38, FEN 1 to 10, PUC 1 and 2, XMAS 1 to 28.

ACCESS: By helicopter or floatplane from Smithers, 70 miles.

OWNERS: Silver Cup Mines Ltd. and Aston Resources Limited.

OPERATOR: SCURRY-RAINBOW OIL LIMITED, 709 Eighth Avenue SW., Calgary, Alta.

METALS: Copper, molybdenum.

DESCRIPTION: Copper and molybdenum mineralization occur in Coast Intrusions.

WORK DONE: Induced polarization survey, 45 line-miles covering all claims.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1968, p. 140; Assessment Report 4207.

OVP, MK (No. 84, Fig. D)

LOCATION: Lat. 53° 33' Long. 127° 22' (93E/11W)
OMINECA M.D. Between 3,000 and 5,500 feet elevation south of Troitsa Lake, 90 miles south of Smithers.

CLAIMS: OVP, MK, totalling approximately 120.

ACCESS: By helicopter from Smithers or Tahtsa Reach.

OWNER: Aston Resources Limited.

OPERATOR: QUINTANA MINERALS CORPORATION, 1215, 555 Burrard Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: A weakly differentiated granitic stock is cut by feldspar porphyry dykes with pyrite, chalcopyrite, and molybdenite mineralization.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; geochemical rock and soil survey, 30 samples; surface diamond drilling, one hole totalling 1,500 feet.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 146.

MO (No. 163, Fig. D)

By B. M. Dudas

LOCATION: Lat. 53° 34' Long. 127° 50' (93E/12W)
SKEENA M.D. Between 1,700 and 5,000 feet elevation approximately 1.5 miles east of Kemano, at the head of Horetzky Creek.

CLAIMS: MO 1 to 6, TAS 1 to 8, 11 to 44.

ACCESS: By helicopter from Kemano, about 1.5 miles, or from Terrace, about 75 miles.

OWNER: Charta Mines Ltd.

OPERATOR: GETTY MINING PACIFIC, LIMITED, 1904, 1177 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum, silver.

(93E/14W)

WORK DONE: Geological mapping; surface trenching; diamond drilling, four short holes.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1906, p. 68 (Pintledanne); 1968, p. 69 (Joe); Assessment Report 3974.

BERG (No. 109, Fig. D)

LOCATION: Lat. 53° 49' Long. 127° 26' (93E/14W)
OMINECA M.D. Between 5,000 and 6,500 feet elevation 6 miles south of Kidprice Lake, 55 miles southwest of Houston.

CLAIMS: BERG, TAKI, totalling 119.

ACCESS: By four-wheel-drive vehicle road from Houston, 80 miles.

OWNER: Kennco Explorations, (Western) Limited.

OPERATOR: CANEX PLACER LIMITED, 800, 1030 West Georgia Street, Vancouver 5.

METALS: Copper, molybdenum.

DESCRIPTION: Copper and molybdenum mineralization is found within a contact aureole around a Tertiary quartz monzonite stock that has intruded rocks of the Hazelton Group.

WORK DONE: Drill holes mapped; surface geological mapping, 1 inch equals 200 feet covering Berg claims; road construction, 2 to 3 miles (between drill holes 76 and 89); surface diamond drilling, 14 holes totalling 11,379 feet on Berg claims.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 157.

BERGETTE (No. 68, Fig. D)

By B. N. Church

LOCATION: Lat. 53° 48.2' Long. 127° 16.9' (93E/14W)
OMINECA M.D. At approximately 6,000 feet elevation 3 miles north of Mount Sweeney and 7 miles south of Smoke Mountain, 45 miles southwest of Houston.

CLAIMS: BERGETTE 1 to 14, BF 1 to 6, 19 to 22, 65, 69, BS 1 to 10, FG 1 to 58, 67 to 74, 79 to 82, 91 to 94, GN 1 to 8, LK 1 to 60, BS 1 to 3 Fractions.

ACCESS: By the Tahtsa forestry access road from Houston, approximately 70 miles.

OWNERS: G.O.M. Stewart and R. Blusson.

OPERATOR: GRANGES EXPLORATION AB, 1060, 1055 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION:

A detailed account of the geology and previous activity of the Bergette property is given in Geology, Exploration, and Mining in British Columbia, 1971, pages 147 to 157. Exploration continued in 1972 in areas of geochemical anomaly adjacent to the drill targets of 1971.

A new chemical analysis is shown in the accompanying table of a specimen used to date

TABLE OF CHEMICAL ANALYSES

	1	2
Oxides Recalculated to 100		
SiO_2	66.53	65.8
TiO_2	0.65	0.6
Al_2O_3	16.77	16.1
Fe_2O_3	1.97	1.8
FeO	2.16	2.7
MnO	0.07	0.1
MgO	1.98	1.9
CaO	2.61	4.5
Na_2O	3.66	3.7
K_2O	3.60	2.8
	100.00	100.0
Oxides as Determined		
SrO	0.05	
BaO	0.04	
H_2O+	1.07	
H_2O-	0.28	
CO_2	nil	
P_2O_5	0.22	
SO_3	0.26	
Molecular Norm		
Quartz	20.8	
Orthoclase	21.4	
Albite	33.0	
Anorthite	13.0	
Enstatite	5.5	
Ferrosilite	1.0	
Magnetite	2.1	
Ilmenite	0.9	
Unassigned	2.3	
	100.0	

1 – Feldspar porphyry, collected in a roadcut about 1,500 feet northeast of the Bergette camp site.

2 – Average granodiorite, Daly (1933); Table 1, Average Compositions, No. 45, p. 15.

the feldspar porphyry phase of the Sibola intrusion which is associated with the mineralization (G.E.M., 1971, p. 149). The porphyry rock has slightly higher potash and somewhat lower lime content than Daly's average granodiorite but otherwise is quite similar.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet; reconnaissance geochemical soil survey, 655 samples covering all claims; road construction, approximately 2 miles (to percussion drill sites); percussion drilling, 14 holes totalling 4,000 feet on Bergette 4, 5, 14, BS 2-5, and BF 6.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 147.

SIB (No. 83, Fig. D)

LOCATION: Lat. 53° 47.9' Long. 127° 06.5' (93E/14E)
OMINECA M.D. Three miles southwest of Twinkle Lake, 60 miles south-southwest of Houston.

CLAIMS: SIB 1 to 8.

ACCESS: By the Morice River and Tahtsa Lake roads from Houston, 60 miles.

OWNER: K. W. Livingstone.

OPERATOR: QUINTANA MINERALS CORPORATION, 1215, 555 Burrard Street, Vancouver 1.

METAL: Molybdenum.

DESCRIPTION: A molybdenum geochemical anomaly was found in soils in the vicinity of slightly pyritized Hazelton rocks.

WORK DONE: Road construction, one-half mile (from the Tahtsa road to the trench); trenching on Sib 5.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 147.

NADI, IDA (No. 66, Fig. D)

LOCATION: Lat. 53° 55' Long. 127° 03' (93E/14E)
OMINECA M.D. At approximately 3,500 feet elevation on the north shore of Nadina Lake.

CLAIMS: NADI 1 to 53, NADI M 1 to 8, IDA 1 to 172.

ACCESS: By helicopter from Houston, 40 miles.

OWNER: JOREX LIMITED, 600, 85 Richmond Street West, Toronto, Ont.

METALS: Copper, molybdenum.

DESCRIPTION: A large pyritized area in Hazelton volcanic rocks, mainly andesites, was explored.

WORK DONE: Induced polarization survey, 23 line-miles; magnetometer survey, 50 line-miles; and geochemical soil survey, 169 samples covering Nadi 1-53, Nadi M 1-8, and Ida 12-22, 33, 34, 55-60, 129-134.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 108; Assessment Reports 3776, 4181, 4182, 4183.

L&H (No. 179, Fig. D)

LOCATION: Lat. 53° 58′ Long. 127° 02.9′ (93E/14E)
OMINECA M.D. On Johnny David Lake, 55 miles south of Smithers.
CLAIMS: L&H 1 to 10, ALE 1 to 6.
ACCESS: By floatplane from Smithers, approximately 55 miles.
OPERATOR: CANEX PLACER LIMITED, 800, 1030 West Georgia Street, Vancouver 5.
METALS: Copper, molybdenum.
DESCRIPTION: Chalcopyrite and pyrite with minor molybdenite occur in quartz veinlets in hornfelsed basalt and granodiorite.
WORK DONE: Geological mapping, 1 inch equals one-quarter mile; geochemical soil survey.
REFERENCE: Assessment Report 4184.

DUAL (CON) (No. 40, Fig. D)

LOCATION: Lat. 53° 54.7′-56.2′ Long. 126° 59′-127° 04′ (93E/14E, 15W)
OMINECA M.D. One mile south of Hill-Tout Lake, 4 miles north of Nadina Lake.
CLAIMS: HT 1 to 34, AFP 1 to 26.
ACCESS: By helicopter from Houston, 40 miles.
OWNER: K. W. Livingstone.
OPERATOR: QUINTANA MINERALS CORPORATION, 1215, 555 Burrard Street, Vancouver 1.
METALS: Copper, molybdenum.
DESCRIPTION: Minor chalcopyrite and molybdenite occur in a silicified, pyritized, and altered zone at the contact between a quartz monzonite stock and volcanic rocks.
WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 1,000 feet covering all claims; geochemical soil and rock survey covering all claims.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 47; Assessment Reports 1647, 3345, 3877.

GEO (No. 67, Fig. D)

LOCATION: Lat. 53° 49.5′-51′ Long. 126° 51.7′-55′ (93E/15W)
OMINECA M.D. At approximately 3,300 feet elevation on Horseshoe Lake, 50 miles south of Houston.
CLAIMS: GEO 1 to 54, CAR 1 to 4.
ACCESS: By the Andrew Bay road from Wistaria, 33 miles.
OWNER: GRANGES EXPLORATION AB, 1060, 1055 West Hastings Street, Vancouver 1.
DESCRIPTION: The Geo claims are situated in an area of virtually no rock exposure. Information from diamond-drill holes indicates a layered sequence of graphitic mudstones, gritstones, and tuff.

(93E/15)

WORK DONE: Electromagnetic survey, 13.64 line-miles covering 14 Geo claims; magnetometer survey, 28.39 line-miles covering Geo 1-54; geochemical soil survey, 35 samples covering one claim; road construction, 1 mile (trail to drill sites); surface diamond drilling, two holes totalling 1,000 feet on Geo 8 and 15.

HELEN (No. 199, Fig. D)

LOCATION: Lat. 53° 49'-51' Long. 126° 41'-46' (93E/15)
OMINECA M.D. At approximately 3,000 feet elevation 2 miles north of the junction of Tahtsa and Whitesail Reach.
CLAIMS: HELEN 1 to 52.
ACCESS: By road, 60 miles from Houston.
OWNER: INTERNATIONAL VISUAL SYSTEMS LTD. (formerly Derby Mines Ltd.), 1860, 505 Burrard Street, Vancouver 1.
WORK DONE: Photogeological survey.
REFERENCE: Assessment Report 3648.

NECHAKO RIVER 93F

GODOT (No. 30, Fig. D)

LOCATION: Lat. 53° 23'-26' Long. 125° 37.0°-40.0' (93F/5E)
OMINECA M.D. At approximately 3,500 feet elevation 1.5 miles north of the east end of Tetachuck Lake, 115 miles southeast of Smithers.
CLAIMS: GODOT 21 to 24, 33 to 38, 43 to 48, GODOT 9, 10, 14, 15, 18, and 19 Fractions.
ACCESS: By helicopter from Smithers, approximately 115 miles.
OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davi
Street, Vancouver 5.
METALS: Copper, molybdenum.
WORK DONE: Induced polarization survey, 8.63 line-miles covering all claims; geochemical soil survey, approximately 300 samples.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 158; Assessment Report 3777.

WT (No. 41, Fig. D)

LOCATION: Lat. 53° 28.4' Long. 125° 33.0' (93F/5E)
OMINECA M.D. Between 3,500 and 4,000 feet elevation 3 miles north of Chelaslie Arm, 53 miles south of Burns Lake.
CLAIMS: WT 1 to 20, 25 to 32, WT 1 to 6 and 9 to 11 Fractions.
ACCESS: By floatplane from Burns Lake or Smithers.

(93F/15W)

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.

METALS: Copper, molybdenum.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 400 feet covering WT 1, 3, 5, 7-13, 19, 20, 25-30 and WT 1-6, 10 Fractions; induced polarization survey, 7.2 line-miles covering WT 1, 3, 9-15, 28-32, and WT 1-6, 10, 11 Fractions.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 158; Assessment Reports 3810, 4403.

E, O (No. 87, Fig. D)

LOCATION: Lat. 53° 57′-58′ Long. 124° 46.3′-53′ (93F/15W)
OMINECA M.D. Approximately 7 miles south of the community of Fraser Lake in the Nithi Valley, 2 miles south of Nithi Mountain.

CLAIMS: E 1 to 49 Fractions, O 1 to 75.

ACCESS: By road from Fraser Lake, 7 miles.

OWNER: RIO TINTO CANADIAN EXPLORATION LIMITED, 615, 555 Burrard Street, Vancouver 1.

METALS: Copper, molybdenum.

WORK DONE: Induced polarization survey, approximately 8.5 line-miles.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 160.

MJM, MINT, LODE (No. 69, Fig. D)

LOCATION: Lat. 53° 57.5′-59′ Long. 124° 48.8′-50′ (93F/15W)
OMINECA M.D. Between 2,800 and 4,100 feet elevation on the east flank of Nithi Mountain.

CLAIMS: MJM, MINT, LODE, totalling 31.

ACCESS: By road from Fraser Lake, 6 miles.

OWNER: NITHEX EXPLORATION & DEVELOPMENT LTD., Box 73, Endako.

METAL: Molybdenum.

WORK DONE: Trenching, 400 feet on MJM 9, 10, and 11; surface diamond drilling, two holes totalling 180 feet on MJM 9.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1966, p. 118 (Enco, Molly, etc.); *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 112.

NITHI (No. 11, Fig. D)

LOCATION: Lat. 53° 58.9′ Long. 124° 48.4′ (93F/15W)
OMINECA M.D. At approximately 3,700 feet elevation on the east slope of Nithi Mountain, 4 miles south of Fraser Lake.

CLAIMS: NITHI 1 to 22, NITHI 23 Fraction.

ACCESS: By road from Fraser Lake, 4 miles.

OWNER: MARVIN SHERMAN, Box 74, Endako.

METAL: Molybdenum.

(93G/13W; 93F/16E)

DESCRIPTION: Molybdenite occurs with pyrite in fractures and quartz veinlets up to 4 inches wide in Casey quartz monzonite.

WORK DONE: Geochemical survey covering Nithi 4-6, 19, and 20 during 1971.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1966, p. 118; Assessment Report 3546.

SIN (No. 71, Fig. D)

LOCATION: Lat. 53° 48.7'-49.7' Long. 123° 52' - 124° 01' (93G/13W; 93F/16E)

Report on this property in section 93G/13W.

PRINCE GEORGE 93G

THUNDER (No. 72, Fig. D)

LOCATION: Lat. 53° 11.8' Long. 122° 21.4' (93G/1W)

CARIBOO M.D. At approximately 4,000 feet elevation on Ahbau Creek, 3 miles east of Cinema, 18 miles east-northeast of Quesnel.

CLAIMS: THUNDER 1 to 34, 37 to 40, 31A to 34A, 47 to 52, MILE 3 to 6, KIM 1 and 2.

ACCESS: By road from Cinema, 3 miles east.

OWNER: EQUATORIAL RESOURCES LIMITED, 1019, 409 Granville Street, Vancouver 2.

METALS: Copper, silver, gold, lead, zinc.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet and geochemical soil survey, 500 samples covering all claims; percussion drilling, five holes totalling 1,530 feet on Thunder 14.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 161.

R, RB (No. 177, Fig. D)

LOCATION: Lat. 53° 09.8'-11.7' Long. 122° 52.4'-56.5' (93G/2W)

CARIBOO M.D. On the east side of Charleson Creek, south of Blackwater Mountain, 20 miles northwest of Quesnel.

CLAIMS: R 1 to 8, RB 1 to 12.

ACCESS: By the Bouchie Lake-Blackwater road from Quesnel.

OWNER: RUDOLF BADER, 404, 1139 Barclay Street, Vancouver 5.

WORK DONE: Airborne magnetometer and radioactivity survey.

REFERENCE: Assessment Report 4186.

(93G/7E, 8W)

K (HIXON QUARTZ) (No. 6, Fig. D)

LOCATION: Lat. 53° 26.4' Long. 122° 32.0' (93G/7E, 8W)
CARIBOO M.D. At approximately 2,700 feet elevation on Hixon Creek, 3 miles east of Hixon, approximately 40 miles southeast of Prince George.

CLAIMS: K 1 to 84, HIXON QUARTZ 1 to 4.

ACCESS: By gravel and dirt road from Hixon, 3 miles.

OPERATOR: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

WORK DONE: Surface geological mapping, line-cutting, and geochemical soil survey during 1971; road construction, 0.10 miles on K 47 and 74 and surface diamond drilling, four holes totalling 1,472 feet on K 47, 49, and 74 during 1972.

REFERENCE: Assessment Report 3484.

SIN (No. 71, Fig. D)

LOCATION: Lat. 53° 45'-50.5' Long. 123° 53' - 124° 01' (93G/13W; 93F/16E)
OMINECA and CARIBOO M.D. At approximately 4,865 feet elevation on Sinkut Mountain, 20 miles south of Vanderhoof.

CLAIMS: SIN 1 to 12, 14 to 91, CAT 13.

ACCESS: By good gravel road from Highway 16, 4 miles south of Vanderhoof, 20 miles.

OWNER: CANEX PLACER LIMITED, 800, 1030 West Georgia Street, Vancouver 5.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet covering all claims.

McLEOD LAKE 93J

SAMSON, TIN, CAN (No. 169, Fig. D)

LOCATION: Lat. 54° 03.5' Long. 122° 19.8' (93J/1W)
CARIBOO M.D. Between 2,000 and 2,600 feet elevation on Bateman Creek, 1 to 2 miles southeast of Giscome, 30 miles east of Prince George.

CLAIMS: SAMSON 1 to 36, TIN 1 to 14, CAN 1 to 40, JHG 1 to 10, ELSA Fraction.

ACCESS: By forestry road from Giscome, 1.5 miles.

OWNER: CENTRAL B.C. EXPLORATION LTD., 1726 West 14th Avenue, Vancouver 9.

METALS: Silver, lead, zinc, copper.

WORK DONE: Trenching 1,800 feet on Samson, Tin, and Can claims; stripping, 1,200 feet on Samson and Can claims.

(93K/2W)

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 160; 1971, p. 162.

FORT FRASER 93K

HAN, FIR (No. 17, Fig. D)

LOCATION: Lat. 54° 13.5'-18' Long. 124° 55' - 125° 07' (93K/2W, 3E, 6E, 7W)

OMINECA M.D. Between 3,500 and 4,000 feet elevation in the vicinity of Justine and Hanson Lakes, 10 miles north of Endako.

CLAIMS: HAN, FIR, HEN, JUS, LENA, SHOV, totalling approximately 458.

ACCESS: By road from Fraser Lake, 50 miles.

OWNER: CANEX PLACER LIMITED, 800, 1030 West Georgia Street, Vancouver 5.

METALS: Copper, zinc, lead.

DESCRIPTION: Mineralization consists of veins and disseminations of pyrite, chalcopyrite, and sphalerite with minor galena in a northerly trending breccia zone that occurs along the contact between foliated quartz diorite and a quartz porphyry stock.

WORK DONE: Surface geological mapping, 1 inch equals one-quarter mile covering Fir 17, Han 1, 15, and 57 and Jus 1 claim groups; induced polarization survey, 17 line-miles covering Fir 1 and 17 and Han 1, 15, 53, 57, and 94 claim groups; geochemical soil survey, 1,000 samples covering Han 1, 15, 53, and 94, Jus 1, Fir 17, and Shov 1 claim groups; road construction, 7 miles (east and north of Hanson Lake); trenching, 7,920 feet on Fir 17 and Han 1, 15, 53, 57, and 94 claim groups; surface diamond drilling, four holes totalling 1,997 feet on Han 53, 83, and 93 claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 164; Assessment Reports 3645, 4282, 4283, 4284.

ENDAKO MINE (No. 191, Fig. D) *

By W. G. Clarke

LOCATION: Lat. 54° 02.3' Long. 125° 07.0' (93K/3E)

OMINECA M.D. North of the east end of Francois Lake, 115 miles west of Prince George.

CLAIMS: Eight hundred and fifty-seven mineral claims of which 22 are held under lease and an additional 72 claims and one mineral lease held by Denak Mines Ltd., a wholly owned subsidiary.

ACCESS: By paved road from Highway 16, 1 mile east of the village of Endako.

OWNER: CANEX PLACER LIMITED (Endako Mines Division), 700, 1030 West Georgia Street, Vancouver 5.

METAL: Molybdenum (production shown on Table I).

WORK DONE:

During 1972, 10,561,000 tons was mined from the pit, of which 6,382,000 tons of 0.149

per cent molybdenite was milled, producing a total of 10,950,264 pounds of molybdenum, both as molybdenite and as molybdic oxide.

The pit and the concentrator operations were reduced from a seven-day to a five-day work week during March.

Diamond drilling projects were conducted on mineral claim groups at Hanson Lake and on the mineral claims of Denak Mines Ltd. Four holes totalling 1,997 feet were drilled on the Hanson Lake property and two inclined holes totalling 1,716 feet were drilled on the Denak property. In addition there was 2,890 feet of percussion drilling on the Denak property and the Pat 97 group of mineral claims.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1965, pp. 136-138; 1966, p. 117; 1967, pp. 114, 115; 1968, p. 142; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, pp. 153, 154; 1970, pp. 114, 115; 1971, p. 165.

PAT (No. 74, Fig. D)

LOCATION: Lat. 54° 02'-03.5' Long. 125° 00'-02' (93K/3E)
OMINECA M.D. At approximately 3,000 feet elevation 4 miles east of the Endako open-pit mine.
CLAIMS: PAT 97, 99, 101, 103, 105, 107 to 114, 116, DOLLY 3 and 4 Fractions, MIST 1 to 18.
ACCESS: By road from the Endako minesite, 4 miles.
OWNER: CANEX PLACER LIMITED (Endako Mines Division), 700, 1030 West Georgia Street, Vancouver 5.
WORK DONE: Percussion drilling, three holes totalling 880 feet on Mist 2, 4, and 12.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 164.

NU, ELK, DEER (No. 75, Fig. D)

LOCATION: Lat. 54° 02'-03.5' Long. 125° 05.5'-10.5' (93K/3E)
OMINECA M.D. At approximately 3,100 feet elevation 5 miles west of Endako.
CLAIMS: NU, ELK, DEER, CORA, DAT, DIS, totalling 75.
ACCESS: By road from Endako, 6 miles.
OWNER: Denak Mines Ltd.
OPERATOR: CANEX PLACER LIMITED, 700, 1030 West Georgia Street, Vancouver 5.
METAL: Molybdenum.
DESCRIPTION: A quartz-molybdenum stockwork occurs in weak to intensely kaolinitic altered Endako quartz monzonite.
WORK DONE: Surface diamond drilling, two holes totalling 1,713 feet on Elk 4 and 5; percussion drilling, 10 holes totalling 2,890 feet on Cora 3 and Nu 6, 7, and 9 claims.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 165.

ANN (No. 1, Fig. D)

LOCATION: Lat. 54° 05.5' Long. 125° 10' (93K/3E)
OMINECA M.D. Immediately south of Highway 16 and Savory Lake, 6 miles west of Endako.
CLAIMS: ANN 1 to 6.
ACCESS: By Highway 16 from Endako, approximately 6 miles.
OWNER: CANWEX EXPLORATIONS LTD., 1666 West Broadway, Vancouver 9.
WORK DONE: Geochemical and induced polarization surveys during 1970 and 1971.
REFERENCE: Assessment Report 3466.

SUE (No. 2, Fig. D)

LOCATION: Lat. 54° 09' Long. 125° 19' (93K/3W)
OMINECA M.D. Immediately east of Priestly, 14 miles west-northwest of Endako.
CLAIMS: SUE 1 to 8.
ACCESS: By Highway 16 from Endako, approximately 14 miles.
OWNER: CANWEX EXPLORATIONS LTD., 1666 West Broadway, Vancouver 9.
WORK DONE: Geochemical and induced polarization surveys during 1971.
REFERENCE: Assessment Report 3467.

GEOLOGY OF THE BUCK CREEK AREA

By B. N. Church

INTRODUCTION: The geology of the Buck Creek area (Fig. 34) was completed by the writer mainly in the years 1970 and 1972. The work began as a detailed study of mineralization near Owen and Goosly Lakes and was expanded at the regional scale to cover approximately 1,250 square miles in the area north of the Nadina River and Francois Lake and south of Highway 16 between Houston and Burns Lake. The adequacy of the coverage can be partly inferred from the distribution of more than 1,800 geological stations visited by the writer, and shown on Figure 35.

This report amplifies information in Geology, Exploration, and Mining in British Columbia, 1970, pages 119 to 125, and is to be followed by a more detailed account to be published in a bulletin.

GENERAL GEOLOGY: As a result of recent mapping considerable light is shed on the distribution, structure, and history of the Tertiary, Upper Cretaceous, and older Mesozoic rocks of the area. This work is supplemented by eight new potassium-argon age determinations – these are listed in the accompanying table together with three previously published dates.

Early and Middle Mesozoic Assemblage: Except for exposures in windows through the lava northeast of Goosly Lake, the oldest rocks thought to be Early or Middle Mesozoic age are peripheral to a centrally located Upper Cretaceous - Tertiary pile. The main exposures of this older assemblage are west of Decker Lake and southwest of Tchesinkut Lake in the east part of the map-area; also on Morice Mountain and in the vicinity of Mud

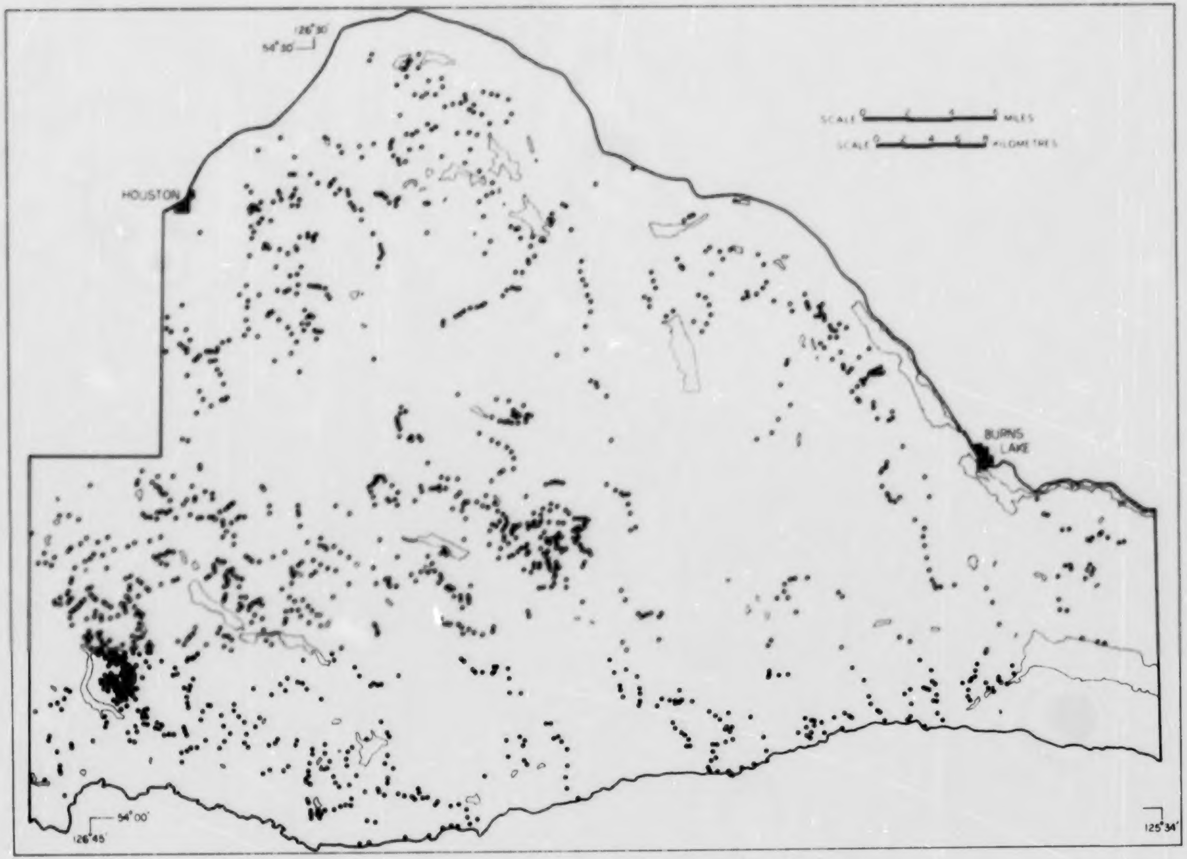

126°30'
54°30'
HOUSTON
SCALE 0 2 4 6 MILES
SCALE 0 2 4 6 8 KILOMETRES
BURNS LAKE
54°00'
126°45'
125°34'

Figure 35. Distribution of geological stations in Buck Creek map-area.

Lake in the west and northwest parts.

These are mainly volcanic rocks which vary considerably in composition and preservation. Arc fusion analyses of 102 representative samples of lavas, pyroclastic rocks, and schistose equivalents give the following compositions: basalt, 17 per cent; andesite, 28 per cent; dacite, 37 per cent; and rhyolite, 18 per cent. Local deviations from this average were observed near Tchesinkut Lake and Mud Lake where there is an abundance of rhyolite and in the Goosly area where dacites predominate.

Sedimentary rocks are generally scarce, however, a band of chert pebble conglomerate can be readily traced from the Goosly Lake area to a point on the north shore of Francois Lake, about 5 miles southwest of Tchesinkut Lake. The absence of granite pebbles in this unit indicates that it was probably deposited prior to unroofing of the Endako granite intrusions (155 to 112 m.y.). Fragmentary remains of marine fossils suggests a surprisingly young Lower Cretaceous age for the conglomerate, however, this is not yet confirmed.

Upper Cretaceous Assemblage: The Upper Cretaceous is represented by an assemblage of continental volcanic rocks and equivalent intrusions. These units are exposed at various points across the map-area but are best developed in the west and west-central parts.

The Tip Top Hill lavas and pyroclastic rocks, mainly andesite and dacite in composition, comprise the thickest beds. These are dated 75.8±2.7 million years substantiating their previous correlation with the Mine Hill microdiorite feeder sills and dykes near Owen Lake, now dated 74.0±2.0 million years.

Extensive diamond drilling in the vicinity of the Silver Queen mine reveals the presence of rhyolite volcanic rocks below the Tip Top Hill Formation in the Owen Lake area. These acid rocks are no doubt the lateral equivalents of quartz porphyry intrusions and rhyolites exposed nearby on Okusyelda Hill. It seems very probable that rhyolite sills and dykes on Tsalit Mountain dated 76.5±3.0 million years, and the Duck Lake granitic intrusion, dated 76.0±2.0 million years, are time equivalents of the Okusyelda Hill rocks.

Elsewhere, centres of significant rhyolite volcanism of probable Upper Cretaceous age occur at the northwest end of Francois Lake, near the west end of Tchesinkut Lake, and in the Bulkley Lake area (*see* Nos. 1 and 2 in the accompanying table). In each case the rhyolite lavas and pyroclastic rocks are exposed in the vicinity of the basement, apparently directly overlying the older rocks.

Tertiary Assemblage: A number of important revisions are made in the Tertiary stratigraphic succession consequent of recent mapping and the new age determinations. For example, it is now known that the Poplar Buttes volcanic rocks are Miocene, not Pliocene as suggested previously, and that the Buck Creek volcanic rocks are Eocene, only slightly younger than the Goosly Lake Formation.

The Goosly Lake-type lavas and pyroclastic rocks, dated 48.0±1.8 million years, extend from Owen Lake to just southwest of Burns Lake and from the Houston area to Francois Lake. The main centre of eruption appears to have been the Goosly syenomonzonite stock dated 48.8±3.0 million years. Other satellite feeder plugs are found near upper Parrott Lake, dated 49.4±1.5 million years and 3 miles southwest of Goosly Lake.

The granitic stock in the Goosly Lake area contains some disseminated chalcopyrite and is tentatively correlated with a similar mineralized intrusion in the Dungate Creek area.

TABLE OF CHEMICAL ANALYSES

	1	2	3	4	5
Oxides Recalculated to 100 –					
SiO_2	76.85	79.50	55.08	66.95	56.29
TiO_2	0.20	0.10	1.00	1.05	1.64
Al_2O_3	13.01	11.51	16.26	16.69	15.93
Fe_2O_3	0.87	0.95	3.68	3.01	5.49
FeO	0.06	0.04	5.65	1.33	3.79
MnO	0.03	0.03	0.15	0.04	0.12
MgO	trace	0.37	6.37	1.05	4.65
CaO	0.41	1.39	7.59	3.49	6.96
Na_2O	3.21	1.46	2.87	3.13	3.64
K_2O	5.36	4.65	1.35	3.26	1.49
	100.00	100.00	100.00	100.00	100.00
Oxides as Determined –					
H_2O+	0.98	3.36	1.74	3.30	1.46
H_2O-	0.39	1.71	0.50	1.06	2.01
CO_2	0.17	0.10	nil	0.09	0.07
SO_3	0.02	----	0.06	0.004	0.008
P_2O_5	0.01	0.01	0.13	0.61	1.23
SrO	----	0.005	----	0.087	0.134
BaO	----	0.005	----	0.064	0.064
Refractive Index –	1.486	1.488	1.579	1.520	1.572

1 – Welded rhyolite tuff, road cut 1.2 miles west of Noralee near the west end of Francois Lake.

2 – Rhyolite lava, exposed in road cut at west end of Tchesinkut Lake.

3 – Buck Creek basalt breccia, at summit of hill north of Dungate Creek, 6.6 miles southeast of Houston.

4 – Parrott Mountain dacite, road cut 0.5 mile southwest of the Parrott Mountain fire lookout station.

5 – Swans Lake basaltic andesite, crest of hill 0.3 mile north of Swans Lake.

No equivalent volcanic rocks are known in the area and it is possible that these rocks although dated 56.2±3.0 million years are actually much older, the biotite 'radiometric clock' having been reset by intrusion of the younger syenomonzonite body.

The Buck Creek volcanic rocks directly overlie the Goosly Lake Formation at many points. These rocks are compositionally diverse and geographically the most widely distributed of all the units in the map-area. At least three subdivisions may be recognized in the field. These are provisionally referred to as the Houston phase, Parrott Mountain phase, and Swans Lake phase.

The Houston phase is most widespread and ranges in composition from basalt to dacite with andesites predominating (*see* analyses No. 3 in the accompanying table). A sample collected near Buck Creek was dated Middle Eocene, 47.3±1.6 million years. Previously these rocks and the post-Eocene Endako Group, defined by Armstrong (1965), were thought to be co-extensive (Church, 1969, p. 143 and Tipper, 1970, p. 36).

The Parrott Mountain phase is a somewhat younger assemblage of petrographically distinctive breccias and lavas which forms a small volcanic centre south of Tsichgass Lake near the north shore of Francois Lake. These are merocrystalline pyroxene-bearing, plagioclase-rich rocks. Arc fusion determinations of 20 samples show a refractive index range of 1.520 to 1.536 indicating mainly dacite compositions (*see* No. 4 in the accompanying table).

The Swans Lake phase occurs in the north and extreme east parts of the map-area. It is mostly massive fine-grained brown lava 50 to 200 feet thick overlying the Houston phase. Arc fusion analyses of 19 samples indicate a basalt-basaltic andesite composition range, with refractive indices falling between 1.564 and 1.584 (*see* No. 5 in the accompanying table).

Rhyolite found on the crest of the ridge north of Tchesinkut Lake is problematic. It appears to have been emplaced by reverse faulting and upward rotation of the Cretaceous beds cutting the younger strata. Rhyolites are generally scarce in the Tertiary succession of the region, the Fenton Creek volcanic rocks northwest of Nadina Mountain being exceptional. However, it is possible that this rhyolite is indeed Tertiary age and is intercalated in the Buck Creek assemblage. If this interpretation is correct then the rhyolite might be correlative with rhyolite dykes known to cut the Goosly syenomomzonite stock.

The Poplar Buttes olivine basalt, dated 21.0±1.1 million years, is the youngest Tertiary formation identified in the area. Evidently these lavas were ponded locally in a deep valley, cooled slowly, and developed an auspicious assemblage of columns. Deposits of superficially similar basalt in the Dungate Creek area, about 12 miles southeast of Houston, are thought to be older rocks and are tentatively assigned to the Buck Creek formation.

STRUCTURE: Owing to the predominance of lavas and pyroclastic rocks in the area bedding attitudes, especially in sequences of layered volcanic breccia, are often unreliable. Initial angles of repose of this material may be as much as 35 degrees. Consequently knowledge of the structural history, including events such as faulting, tilting, and folding of the strata, is fragmentary.

From the few valid measurements of waterlain sedimentary rocks and considerations of general distribution of the lithological units, the Tertiary and Upper Cretaceous beds are normally gently dipping. In contrast, the older rocks are more variable in attitude. The chert pebble conglomerate found in the Goosly Lake area and on the north shore of Francois Lake certainly displays steep dips; in a few places the unit is almost vertical. The interval between deposition of this conglomerate, possibly Lower Cretaceous, and the emplacement of the Upper Cretaceous volcanic rocks was undoubtedly marked by some important tectonic events.

The more recent history appears to have been one of gentle tilting of fault blocks almost in a random fashion. Here and there old Mesozoic rocks are exposed at the base of these blocks forming a number of small windows in the Upper Cretaceous and Tertiary pile.

The results of a detailed study of the orientations of topographic lineaments of the region are compatible with the fracture patterns in the centrally located Goosly area, Figure 36. For example, two strong sets of fractures showing maximum development at about 070/90 and 160/70 southwest are coincident in strike with the main lineament modes. These directions appear to be subparallel to important faults defining a number of large tilted blocks.

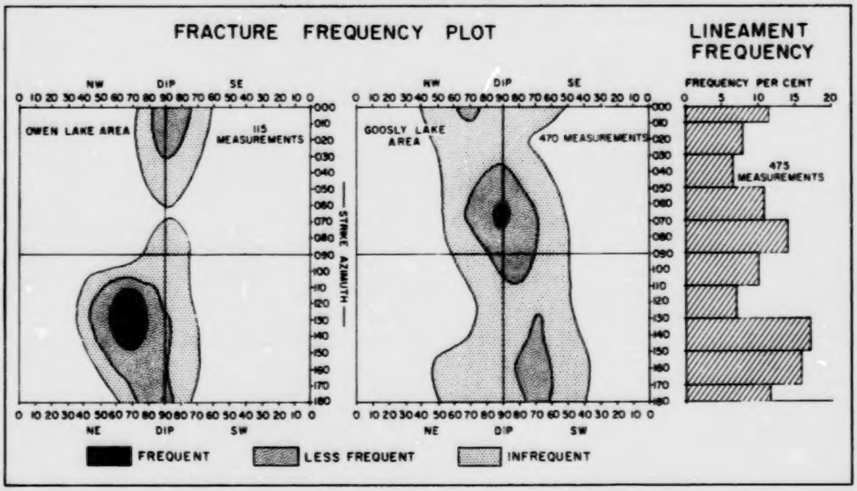


Figure 36. A comparison of fracture frequency patterns and the direction frequency of regional topographic lineaments, Buck Creek map-area.

POTASSIUM – ARGON AGE DETERMINATIONS FOR THE BUCK CREEK AREA

No.	Source Material	Location		Age
		Latitude	Longitude	Millions of Years
1	Poplar Buttes volcanic rocks (whole rock)	54° 03.1′	126° 34.8′	21.0±1.1
2	Buck Creek volcanic rocks, Houston phase (whole rock)	54° 10.6′	126° 38.1′	47.3±1.6
3	Goosly Lake volcanic rocks (whole rock)	54° 09.4′	126° 18.1′	48.0±1.8
4*	'T-Allin dacite' (biotite)	54° 03.5′	125° 57.1′	53.0±2.0
5	Tip Top Hill volcanic rocks (whole rock)	54° 10.2′	126° 21.4′	75.8±2.7
6	Tsalit Mountain rhyolite (whole rock)	54° 08.5′	126° 52.8′	76.5±3.0
7*	Goosly syenomonzonite stock (biotite)	54° 11.4′	126° 15.4′	48.8±3.0
8	Parrott Lake syenomonzonite stock (biotite)	54° 07.3′	126° 36.0′	49.4±1.5
9*	Goosly granitic stock (biotite)	54° 11.2′	126° 16.8′	56.2±3.0
10	Mine Hill microdiorite sill (whole rock)	54° 05.2′	126° 44.0′	74.0±2.0
11	Duck Lake granitic stock (biotite)	54° 01.5′	126° 48.1′	76.0±2.0

*Samples 7 and 9 were collected by the writer and dated by N. C. Carter at the University of British Columbia (G.E.M., 1969, pp. 146, 147). No. 4 is a result published by W. H. Mathews (1964). The remaining dates were determined by J. Harakal at the University of British Columbia.

The Owen Lake area appears to be a peripheral structural domain not exactly typical of the region. The strongest fractures strike about 130 degrees, dip steeply to the northeast, and are coincident with the attitude of important vein mineralization in the area.

EXPLANATION OF THE ARC FUSION METHOD: In recent studies of the aphanitic volcanic rocks of the Buck Creek area and elsewhere, the arc fusion method proposed by Mathews (1951) has proven exceedingly useful. The method provides a rapid, inexpensive, and reliable guide to the chemical composition of aphanitic volcanic rocks. Where the method is employed numerous determinations are possible yielding sufficient data to establish frequency distributions and composition ranges for rock suites.

The relationship between the refractive index of glasses prepared by artificial fusion and the composition of the corresponding rocks follows Gladstone's Law:

$$R.I. = 1 + (S.R._t)(S.G.)$$

where R.I. is the refractive index, $S.R._t$ is the specific refractivity, and S.G. is the specific gravity of glass.

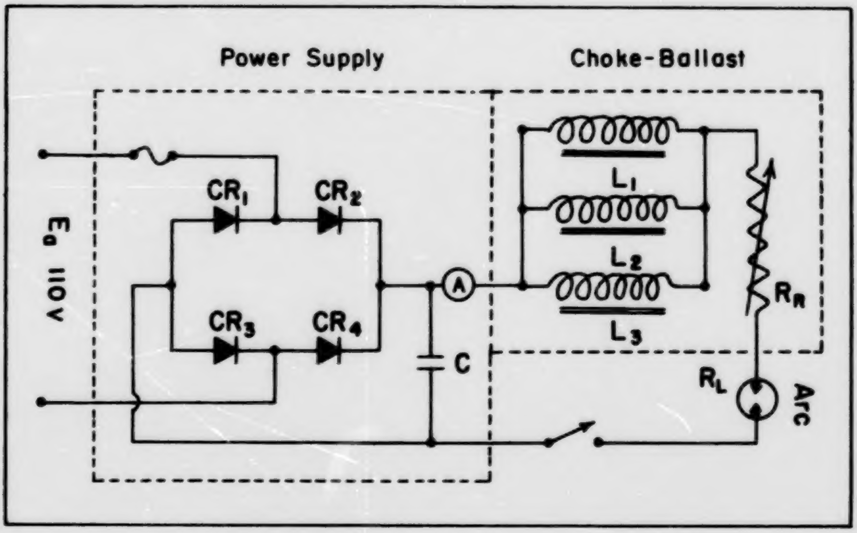


Figure 37. Schematic circuit diagram of arcing.

The Arcing Device: The main components of the arcing device are the power supply unit, choke and ballast coils, current regulator, and arc mount. The schematic circuit diagram is shown on Figure 37. The power supply consists of four silicon 25-ampere rectifiers arranged for full wave rectifications from a 110-volt A.C. source. The combination of a 15-microfarad condensor in series with three parallel iron core inductance coils (45 ohms each) is a typical 'L-section filter' yielding a low ripple circuit

CORRELATION OF THE REFRACTIVE INDEX OF GLASS AND ROCK COMPOSITIONS

Rock Type	R.I.	Spectrochemical Results FeO per cent	 MgO per cent	 CaO per cent
olivine basalt	1.602	10.6	12.0	9.80
(pyroxene) hornblende andesite	1.555	6.80	6.00	10.0
hornblende andesite	1.551	6.20	5.20	7.20
pyroxene andesite	1.540	6.00	4.90	8.60
(biotite) pyroxene andesite	1.539	4.90	3.65	7.70
(pyroxene) biotite andesite	1.538	5.20	4.90	6.20
(biotite) pyroxene andesite	1.538	4.81	3.30	6.40
pyroxene phonolite	1.532	4.30	2.40	4.20
pyroxene trachyte	1.531	4.30	1.80	2.80
pyroxene trachyte	1.529	5.20	3.30	6.20
pyroxene trachyte	1.523	4.60	2.50	3.80
(pyroxene) biotite trachyte	1.523	3.30	0.79	3.30
(biotite) pyroxene trachyte	1.521	3.70	0.84	4.20
biotite dacite	1.520	3.45	1.80	4.10
biotite dacite	1.518	3.70	1.45	3.80
biotite trachyte	1.517	3.70	1.50	3.90
(pyroxene) biotite trachyte	1.517	3.20	0.55	2.40
(pyroxene) biotite trachyte	1.509	3.75	1.50	1.80
(pyroxene) biotite trachyte	1.503	3.85	1.30	1.30
biotite rhyolite	1.497	1.96	0.45	1.40

(Total iron is determined as FeO.)

Calculation of the product moment correlation coefficient –

Formula: $$R = \frac{\Sigma(x)(y) - (\Sigma x \Sigma y)/n}{\sqrt{(\Sigma x^2 - (\Sigma x)^2/n)(\Sigma y^2 - (\Sigma y)^2/n)}}$$

R = 1 for perfect correlation.
R = 0 for no correlation.

		R
FeO	versus R.I.	0.95
MgO	versus R.I.	0.95
CaO	versus R.I.	0.88

of near constant D.C. voltage. The current regulator (3 to 8 ohms) acting in conjunction with the coils provides adequate circuit ballast and control. The arc mount consists of two parallel wooden electrode support arms affixed to a chassis and fitted with spring-clip-type electrode holders. Two carbon electrodes (6 millimetres in diameter, uncored special grade) are clamped through these arms and arranged vertically and counterposed with about one-quarter-inch separation. The electrodes are tapered to about half diameter using a pencil sharpener; this allows proper focus of the electrical charge at the tips of the electrodes thereby reducing arc wandering tendencies and heat dissipation.

Procedure: The procedure is essentially that outlined by Mathews. First, several representative chips from a hand specimen of volcanic rock are carefully crushed to a granular aggregate in a steel mortar by percussion motion of the pestle. About 100 milligrams of this granular material is removed and ground to powder (less than 200 mesh) in a small agate mortar. Then about 5 milligrams of this rock powder is introduced into a broad crater about 2 millimetres deep, carved in the upper end of the lower electrode of the arcing device. Using 110 volts (open circuit) and about 5 amperes it is possible to completely fuse the powder in 3 to 5 seconds of sustained arcing. Initial arc temperatures, resulting simply from electrical resistance are slightly in excess of 1300 degrees centigrade, above the melting point of basalt, however, prolonged arcing results in combustion of the carbon electrodes – this process is markedly exothermic and yields extreme temperatures – sufficient to cause complete volatilization of about 10 milligrams of rock powder in a 10 to 20-second arc period. According to Mathews, the significant changes brought about in the composition of the rock as a result of artificial melting are essentially the loss of water and the homogenization of the oxidation state of iron.

About a dozen glass beads are prepared in the arcing device for each rock sample collected. The beads are subsequently crushed together in an agate mortar and the refractive index of the broken glass is determined with the aid of immersion oils and a refractometer.

Application: In practice it is known that the most refractory major oxide constituents of common volcanic rocks, iron oxide, magnesia, and lime have a strong positive correlation with the refractive index of the prepared glass. This is shown in the accompanying table where the product moment correlation coefficients are calculated for 20 analysed rocks of diverse composition.

The broader relationship between glass and total major oxide composition of common volcanic rocks is shown on Figure 38. The basicity index of the plot, $FeO + Fe_2O_3 + \frac{1}{2}(CaO + MgO)$, as might be expected, displays remarkably good correlation with refractive index.

A general division of rock types is possible based only on refractive index. For the most part rhyolites have R.I. values lower than 1.505 whereas basalts are above 1.575. Dacites, trachytes, and phonolites overlap somewhat; the best mean cutoff value marking the upper limit of these rocks and the lower limit of andesite is about 1.535.

Conclusions: The arc fusion method is designed to supplement chemical data on volcanic rocks. Determinations are reliable and can be performed quickly by a laboratory assistant with little training. The method has the potential of yielding much valuable data to assist field mapping, petrological interpretation, and can be used to assist in the selection of rocks for special study such as full silicate analysis.

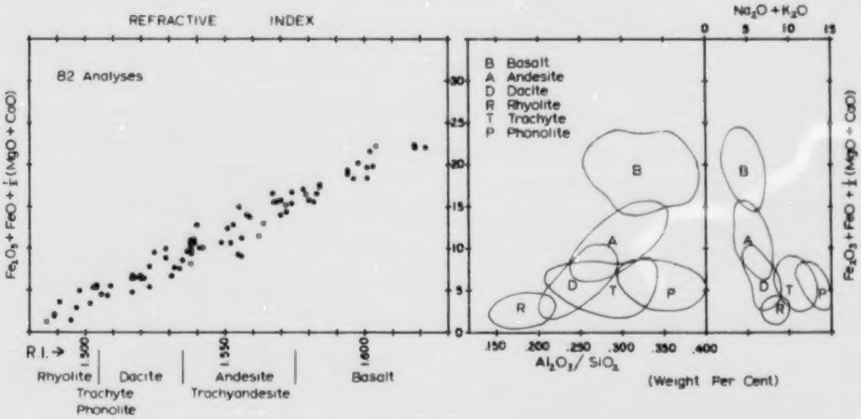


Figure 38. Composite diagram showing the correlation of the basicity index with total major oxide composition of the main volcanic rock types and the refractive index of the corresponding artificially prepared glass. The fields of chemical variation of common volcanic rocks shown in the plot on the right are based on statistical analyses of 1,486 superior analyses from Washington's tables (1917). The plot on the left shows analyses of diverse volcanic suites from British Columbia, the open circles represent analyses from the Buck Creek map-area.

REFERENCES: Armstrong, J. E. (1965), *Geol. Surv., Canada,* Mem. 252, 210 pp.; Mathews, W. H. (1951), *Amer. Mineralogist,* Vol. 36, pp. 92-101; Mathews, W. H. (1964), *Geol. Soc. Amer.,* Bull., Vol. 75, pp. 465-468; *U.S. Government Printing Office,* Washington (1964), NAVPERS 93400-2, Fundamentals of Electronics, Vol. 2, Power Supplies and Amplifiers; Tipper, H. W. (1970), *Geol. Surv., Canada,* Report of Activities, Pt. A, pp. 34-36; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, pp. 122-148; 1970, pp. 119-125.

(93K/9W)

DAD (No. 129, Fig. D)

LOCATION: Lat. 54° 31′-32.5′ Long. 124° 17′-20′ (93K/9W)
OMINECA M.D. At approximately 2,300 feet elevation between Stewart and Pinchi Lakes, 7 miles north-northwest of Fort St. James.

CLAIMS: DAD, totalling 54.

ACCESS: By road from Fort St. James, 10 miles.

OWNER: COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 5.

METAL: Mercury.

DESCRIPTION: A mercury prospect occurs in a harzburgite-gabbro-greenstone sequence faulted by a northwest-trending system of faults that form the southwest margin of the Pinchi fault zone.

WORK DONE: Surface geological mapping, 4 inches equals 1 mile; geochemical soil survey, 300 samples covering Dad 1-6, 11-16, and 23-27; airborne mercury geochemical survey, 20 line-miles covering all claims; trenching, 200 feet on Dad 16; percussion drilling, eight holes totalling 1,800 feet on Dad 15 and 16.

PINCHI LAKE MINE (No. 162, Fig. D)

By A. D. Tidsbury

LOCATION: Lat. 54° 38.0′ Long. 124° 26.1′ (93K/9W)
OMINECA M.D. On the north shore of Pinchi Lake.

CLAIMS: One hundred and sixty-nine.

ACCESS: By gravel road 29 miles northwest from Fort St. James.

OWNER: COMINCO LTD., Box 220, Fort St. James; mine office, Pinchi Lake.

METAL: Mercury.

WORK DONE:

During the year, ore was obtained from both underground and the West zone open pit.

Underground, by mechanized cut-and-fill methods, ore was taken from two levels. Diesel-powered trackless equipment is utilized for ore and main haulage, drilling, loading, mucking, and materials handling. Fill is deslimed mill tailings with a 1 to 20 mix of Portland cement. Fill is hydraulickally emplaced.

Open-pit mining won the major recoverable portion of ore-grade material in the West zone pit. Drilling and blasting were by Cominco loading and contract hauling.

The nominal 850-tons-per-day plant operated below rated capacity due to depressed market conditions. Operations include crushing, grinding, flotation, roasting, and condensing of vapours.

Underground diamond drilling totalled 12,396 feet and underground development consisted of 394 feet of drifting, 345 feet of crosscutting, and 26 feet of raising for a total of 765 feet.

Mine personnel were active in first-aid and mine-rescue training and competition.

Experimental seeding of grasses and trees was continued at selected sites. Results were good, and as surface workings become exhausted and stabilized, reclamation will proceed.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 167.

CIN (No. 117, Fig. D)

LOCATION: Lat. 54° 38.6′ Long. 124° 27.8′ (93K/9W)
OMINECA M.D. At approximately 2,300 feet elevation north of Pinchi Lake, northwest and southeast of the Pinchi Lake mine.

CLAIMS: CIN, totalling 71.

ACCESS: By road from Fort St. James, 20 miles north.

OWNER: Highland Mercury Mines Limited.

OPERATOR: COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 5.

METAL: Mercury.

DESCRIPTION: Fault-controlled cinnabar occurs in glaucophanic Cache Creek rocks in the Pinchi fault zone.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Cin 5-10, 23-28, 38, 40, 42, 44, and 57-64; geochemical soil survey, 200 samples covering two claims; airborne mercury geochemical survey, 50 line-miles covering all claims; road construction, one-half mile on Cin 44, 46, 61, and 63; trenching, 2,000 feet on Cin 44, 46, 61, and 63; percussion drilling, 11 holes totalling 2,111 feet on Cin 10, 14, and 67.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 167.

MARV (No. 73, Fig. D)

LOCATION: Lat. 54° 43.5′-45.7′ Long. 125° 49′-54′ (93K/12W)
OMINECA M.D. At approximately 3,000 feet elevation 3 miles east of Babine Lake, between Wright Bay and Big Loon Lake, 60 miles northeast of Houston.

CLAIMS: MARV 1 to 110.

ACCESS: By helicopter from Houston, 60 miles.

OWNER: JOREX LIMITED, 600, 85 Richmond Street West, Toronto, Ont.

DESCRIPTION: Exposures are mainly pyroxene basalts.

WORK DONE: Induced polarization survey, 14 line-miles, magnetometer survey, 17 line-miles, and geochemical soil survey, 360 samples covering Marv 3-20 and 31-50.

REFERENCE: Assessment Report 4187.

SMITHERS 93L

BJ, DM (No. 22, Fig. D)

LOCATION: Lat. 54° 13′-16′ Long. 126° 13′-16.5′ (93L/1)
OMINECA M.D. At 4,400 feet elevation on Foxy Creek, 7 miles northeast of Goosly Lake.

CLAIMS: BJ 1 to 50, DM 1 to 41.

ACCESS: By road, 20 miles from Houston.

OWNER: INTERNATIONAL VISUAL SYSTEMS LTD. (formerly Derby Mines

(93L/1W)

Ltd.), 1860, 505 Burrard Street, Vancouver 1.
DESCRIPTION: Volcanic rocks, ranging from rhyolite to basalt, outcrop along Foxy Creek.
WORK DONE: Photogeological survey.
REFERENCE: Assessment Report 3648.

DG (No. 4, Fig. D)

LOCATION: Lat. 54° 10.5'-12' Long. 126° 19'-20.5' (93L/1W)
OMINECA M.D. Immediately north of the east shore of Sam Goosly Lake, 30 miles southeast of Houston.
CLAIMS: DG 1 to 42; W 3 to 8.
ACCESS: By road from Houston, 30 miles.
OPERATOR: PAYETTE RIVER MINES LIMITED, 308, 1489 West Broadway, Vancouver 9.
WORK DONE: Induced polarization survey, 6.3 line-miles during 1971.
REFERENCES: Assessment Reports 2311 (NWB, ARC), 3508.

DIAMOND BELLE (No. 94, Fig. D)

By B. N. Church

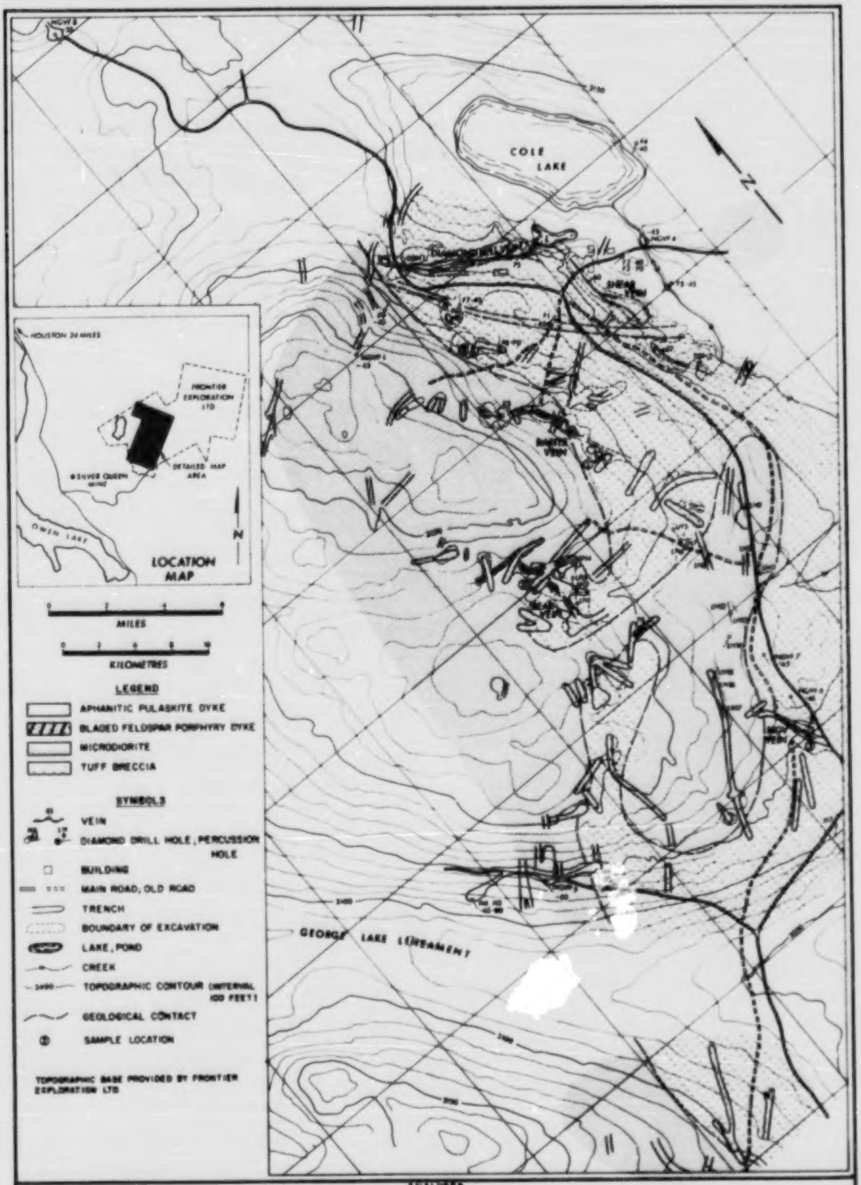
LOCATION: Lat. 54° 06' Long. 126° 42' (93L/2E)
OMINECA M.D. At approximately 2,700 feet elevation 2 miles east of Owen Lake, 30 miles south of Houston.
CLAIMS: DIAMOND BELLE, BLACK BEAR, ETHEL, BELL 1 to 3, BELL 1 to 5 Fractions, IVAN Fraction, VAN 1 Fraction, VAN 1 to 9.
ACCESS: By road from Houston, 30 miles.
OWNER: FRONTIER EXPLORATION LIMITED, 707, 475 Howe Street, Vancouver 1.
METALS: Silver, zinc, lead, copper, gold, cadmium.
DESCRIPTION:

This is a detailed updated report expanding on the general account of this property given in Geology, Exploration, and Mining in British Columbia, 1969 and 1970.

The accompanying map (Fig. 39) shows the position of new roads, trenches, drill holes, and the main veins together with the local geology.

REVIEW OF ACTIVITY: According to company reports, nine AQ diamond-drill holes were completed early in 1970 ('F' series holes) totalling 3,004 feet in the vicinity of the Cole vein system. Later while the property was under option to Northgate Exploration Ltd. one of these AQ holes was extended and four more were completed totalling 2,005 feet ('NGVF' series holes).

As a result of the F series drilling, a narrow vein was discovered a few hundred feet southwest of the Diamond Belle vein, striking southeasterly close and roughly parallel to a pulaskite dyke. Diamond-drill holes F 7 and F 8 pierced this vein yielding the following assay results respectively: gold, 0.2 ounce per ton; silver, 12.8 ounces per ton; copper, 0.27 per cent; lead, 14.7 per cent; zinc, 6.63 per cent; and cadmium, 0.07 per cent over an intersected length of 1.2 feet and gold, 0.11 ounce per ton; silver, 6.1 ounces per ton;


COLE LAKE
N
GEORGE LAKE LINEAMENT
HOUSTON 24 MILES
FRONTIER EXPLORATION LTD
SILVER QUEEN MINE
DETAILED MAP AREA
OWEN LAKE
N
LOCATION MAP
MILES
KILOMETRES
LEGEND
APHANITIC PULASKITE DYKE
BLADED FELDSPAR PORPHYRY DYKE
MICRODIORITE
TUFF BRECCIA
SYMBOLS
VEIN
DIAMOND DRILL HOLE, PERCUSSION HOLE
BUILDING
MAIN ROAD, OLD ROAD
TRENCH
BOUNDARY OF EXCAVATION
LAKE, POND
CREEK
TOPOGRAPHIC CONTOUR (INTERVAL 100 FEET)
GEOLOGICAL CONTACT
SAMPLE LOCATION
TOPOGRAPHIC BASE PROVIDED BY FRONTIER EXPLORATION LTD

ANALYSES

SAMPLE NO.	Au	Ag	Cu	Pb	Zn	As	Sb	Fe	Mn	Co	Cd	Te	GANGUE WEIGHT	SAMPLE WIDTH
	oz/ton		%	%	%	%	%	%	%	%	%	ppm	%	inches
1	Tr.	1.3	0.04	0.58	1.10	0.07	0.03	12.80	7.80	0.38	Tr.	1	71	42
2	0.02	6.2	0.46	5.80	16.65	0.12	0.20	12.10	14.80	0.13	0.14	1	37	23
3	Tr.	2.7	0.10	3.06	26.80	0.02	0.03	8.40	7.35	0.16	0.16	2.5	38	16

Figure 39. Geology of the Diamond Belle, Frontier Exploration Limited.

copper, 0.11 per cent; lead, 5.89 per cent; zinc, 13.87 per cent; and cadmium 0.13 per cent over an intersected length of 2.2 feet.

The NGVF series of diamond-drill holes cut several mineralized zones, the most important of which appears to be the NGV vein located just west of the main road in the southern part of the prospect area. This is a sphalerite-galena rich vein which according to records shows the following values over a 30-inch mineralized length of core: gold, 0.04 ounce per ton; silver, 13.05 ounces per ton; copper, 0.17 per cent; lead, 12.80 per cent; and zinc, 10.20 per cent. At surface the vein can be traced over a length of 150 feet with an overall strike of about 160 degrees, dipping 75 degrees northeast. A 16-inch-wide section of the vein near the road was sampled by the writer and submitted for comprehensive analysis which showed: gold, trace; silver, 2.7 ounces per ton; copper, 0.10 per cent; lead, 3.08 per cent; zinc, 26.69 per cent; iron, 8.40 per cent; manganese, 7.53 per cent; calcium, 0.18 per cent; cadmium, 0.18 per cent; arsenic, 0.02 per cent; antimony, 0.05 per cent; and tellurium, 2.3 ppm.

To the west diamond-drill hole NGVF 5 met sporadic mineralization to a depth of about 850 feet in an area below the George Lake lineament (Fig. 39). (This valley appears to mark the course of a glacial meltwater channel which trends southeasterly from the south end of George Lake bisecting Mine Hill.)

Additional diamond-drill holes completed by Frontier in 1972 to the north and south of NGVF 5 confirmed the presence of a series of apparently discontinuous veins below the lineament extending along strike for at least several hundred feet. Diamond-drill hole H 4 plunging 45 degrees southwest reportedly intersected a vein in the interval between 109 and 114 feet from the collar which assayed: silver, 3.4 ounces per ton; lead, 4.58 per cent; and zinc, 7.64 per cent. Hole H 5 plunging 80 degrees in the same direction from the same collar showed two intersections, one of 14 feet in the interval 57 and 71 feet from the collar which assayed: gold, 0.10 ounce per ton; silver, 2.6 ounces per ton; lead, 0.80 per cent; and zinc, 28.13 per cent. The second intersection was 6 feet in the interval between 231 and 237 feet from the collar and assayed: gold, 0.04 ounce per ton; silver, 2.6 ounces per ton; lead, 1.64 per cent; and zinc, 3.36 per cent. Hole H 6, located approximately 400 feet southeast of H 4 and H 5, intersected what appears to be the same zone cutting a vein in the interval between 467 and 471 feet from the collar; this section assayed: silver, 4.6 ounces per ton; lead, 2.42 per cent; zinc, 19.31 per cent; and cadmium, 0.14 per cent.

In addition to the diamond drilling described above extensive trenching in recent years has led to some important mineral discoveries. For example, the so-called 'Barite vein' was uncoverd about 500 feet west of the Cole vein system. This vein strikes southeasterly and is exposed discontinuously over a length of 350 feet. A gangue-rich sample obtained by the writer across a 42-inch width at the extreme south end of the vein was submitted for detailed analysis and showed: gold, trace; silver, 2.7 ounces per ton; copper, 0.04 per cent; lead, 0.58 per cent; zinc, 1.10 per cent; iron, 12.90 per cent; manganese, 7.80 per cent; calcium, 0.36 per cent; cadmium, trace; arsenic, 0.07 per cent; and antimony, 0.03 per cent. According to company reports, however, a 46-inch-wide sample taken across a northerly part of the vein assayed: gold, .063 ounce per ton; silver, 6.15 ounces per ton; copper, 0.21 per cent; lead, 5.3 per cent; and zinc, 13.2 per cent.

GEOLOGY: Detailed mapping of the newly exposed rocks in the trenches shows that the east contact of the microdiorite intrusion is more sinuous than previously thought. The intruded, host volcanic breccia of the Tip Top Hill Formation, is generally massive with no apparent bedding. Diamond-drill holes NGVF 5 and 6 have penetrated this unit intersecting rhyolitic rocks possibly correlative with the Okusyelda Hill assemblage. Hole NGVF 5 intersects the top of the rhyolitic unit at a vertical depth of about 820 feet; hole NGVF 6 first cuts these rocks at a depth of 620 feet. The top 50 feet of the acid unit in hole NGVF 6 consists of gently dipping accretionary lapilli beds. Hole NGVF 8, in the north part of the prospect area, appears to be collared in the acid volcanic rocks. The impression is given that acid volcanic unit has an undulating and possibly eroded surface.

The Tip Top Hill volcanic breccia is commonly much altered near the veins. This is shown by an analysis of a sample of pyritized breccia near the south extremity of the 'Bear vein' (analysis No. 1 in the accompanying table) which shows high manganese oxide, potash, carbon dioxide, and sulphur oxide, and a difficiency of alumina and soda compared to the equivalent fresh rocks.

COMPARISON OF FRESH AND ALTERED TIP TOP HILL VOLCANIC ROCKS

	1	2
SiO_2	57.70	57.18
TiO_2	0.72	0.79
Al_2O_3	14.36	17.38
Fe_2O_3	2.46	3.69
FeO	3.06	2.10
MnO	0.54	0.10
MgO	2.44	1.81
CaO	4.40	6.04
Na_2O	0.16	4.52
K_2O	4.27	1.87
H_2O+	2.20	3.47
H_2O-	0.55	0.52
CO_2	6.15	0.01
SO_3	3.30	---
P_2O_5	0.073	0.27
SrO	---	0.024
BaO	---	0.14

1 – Altered Tip Top Hill volcanic breccia near south extremity of the 'Bear vein,' Owen Lake area.

2 – Fresh Tip Top Hill pyroclastic rocks, analysis No. 8, page 124, Geology, Exploration, and Mining in British Columbia, 1970.

(93L/2E)

WORK DONE: Ground electromagnetic survey, 10 line-miles covering all claims; surface diamond drilling, five holes totalling 2,200 feet on Diamond Belle and Black Bear; percussion drilling, five holes totalling 1,700 feet on Diamond Belle and Black Bear.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 171.

SILVER QUEEN (No. 192, Fig. D)

By W. G. Clarke

LOCATION: Lat. 54° 05' Long. 126° 43.8' (93L/2E)
OMINECA M.D. The mine is just east of Owen Lake, 21 miles due south of Houston.

CLAIMS: A total of 144 mineral claims and fractions including 17 Crown-granted claims.

ACCESS: Twenty-eight miles from Houston via the Morice River and Owen Lake gravel roads.

OWNERS: Seventeen Crown-granted claims owned by Canex Placer Limited and 127 located claims owned by Nadina Explorations Limited.

OPERATOR: BRADINA JOINT VENTURE, 1005, Two Bentall Centre, Vancouver 1; mine address, Box 489, Houston.

METALS: Gold, silver, copper, lead, zinc, cadmium (production shown on Table I).

DESCRIPTION: The geology, exploration, and development history of the Silver Queen mine has been reviewed in detail in *Geology, Exploration, and Mining in British Columbia,* 1969 and 1970.

WORK DONE:

The construction of the concentrator and ancillary installations commenced during 1971 was completed at the end of February 1972 and operations started early in March. Plant capacity is 500 tons per day but up to 600 tons per day has been milled on occasion. Serious metallurgical problems were encountered initially but these were solved during the year. Eight additional flotation cells were installed in July. There was 111,907 tons milled.

On surface, a timber-framing shed and a battery-charging station were constructed. A glycol-loop heating system, using waste heat from the diesel generators, was installed to heat the crushing plant, coarse ore bin, battery-charging station, and mine air. The camp was expanded.

Underground 154,207 tons of ore and 691 tons of waste were broken and 86,303 tons was trammed to the mill. The surface stockpile supplied 27,261 tons of mill feed. Subdrifting amounted to 3,208 feet and raising to 1,997 feet. The original shrinkage stoping method of mining was discontinued late in the year and those stopes were being cleaned down. At year end all ore was coming from open stull, open square set, or room-and-pillar stopes.

An electromagnetic survey was carried out over two-thirds of the property, followed by diamond drilling. Fifteen holes were drilled from surface, for a total of 4,240 feet, and 25 holes were drilled underground, for a total of 3,953 feet.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1965, pp. 81-84; *B.C. Dept. of*

(93L/2E)

Mines & Pet. Res., G.E.M., 1969, pp. 126-139; 1970, pp. 134-137; 1971, pp. 171, 172.

MO, CD (No. 21, Fig. D)

LOCATION:	Lat. 54° 03' Long. 126° 43.5' (93L/2E) OMINECA M.D. One mile southeast of the south end of Owen Lake, 24 miles south of Houston.
CLAIMS:	MO 1 to 20, CD 1 to 6, CINDY 1 to 4, JENNY 101 Fraction.
ACCESS:	By the Silver Queen mine road.
OWNER:	DARKHAWK MINES LTD., 409 Granville Street, Vancouver 1.
WORK DONE:	Self-potential survey and line-cutting covering 15.5 line-miles.
REFERENCES:	*B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 133; Assessment Report 3661.

HDP (No. 29, Fig. D)

LOCATION:	Lat. 54° 04.5' Long. 126° 41' (93L/2E) OMINECA M.D. At elevations of 3,000 to 3,500 feet 2.5 miles east of Owen Lake, 23 miles south of Houston.
CLAIMS:	HDP, GO, totalling 27.
ACCESS:	By the Morice River road and the Silver Queen mine road from Houston, 30 miles.
OWNER:	CONQUEST EXPLORATION LTD., R.R. 13, Thunder Bay, Ont.
WORK DONE:	Induced polarization and resistivity survey; line-cutting.
REFERENCES:	*B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 171; Assessment Reports 3747, 3748.

PAR (No. 88, Fig. D)

LOCATION:	Lat. 54° 04.7'-07' Long. 126° 36'-37.2' (93L/2E) OMINECA M.D. At approximately 3,000 feet elevation on the southwest shore of the northernmost of the Parrott Lakes.
CLAIMS:	PAR 1 to 77.
ACCESS:	By road from Houston, 20 miles.
OWNER:	CANADIAN SUPERIOR EXPLORATION LIMITED, Box 100, Smithers.
DESCRIPTION:	The property is centred on a Goosly-type Eocene stock.
WORK DONE:	Magnetometer survey, 28 line-miles covering Par 5, 7, 8, 11, 13, 14, 17, 19, 20, 25, 26, 29, 31, 32, 35, 36, 41-55; electromagnetic survey, 28 line-miles covering the same claims.
REFERENCES:	*B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 170; Assessment Report 3509.

CRAM (No. 14, Fig. D)

LOCATION: Lat. 54° 06.5′ Long. 126° 43.4′ (93L/2E)
OMINECA M.D. One mile east of the northern end of Owen Lake.

CLAIMS: CRAM 1 to 10.

ACCESS: By the Silver Queen mine road.

OWNER: A. P. FLETCHER, Box 668, Prince George.

WORK DONE: Geochemical survey, 276 soil and 16 rock samples during 1971.

REFERENCE: Assessment Report 3682.

WINN (No. 102, Fig. D)

LOCATION: Lat. 54° 07′ Long. 126° 43′ (93L/2E)
OMINECA M.D. At 3,000 feet elevation approximately 5 miles northwest of the Silver Queen mine.

CLAIMS: WINN, totalling 40.

ACCESS: By road from Houston, 27 miles.

OWNER: MAHARAJA MINERALS, LIMITED, 1102, 207 West Hastings Street, Vancouver 3.

DESCRIPTION:

The property is underlain largely by Upper Cretaceous Tip Top Hill andesite and dacitic volcanic rocks which are rather sparsely exposed on the ridge crests and creek bottoms in the area just northwest of Winninyik Hill. The property is centred on some old trenches which display veinlets of pyrite, sphalerite, and galena mineralization (showing No. 4 on Fig. 34). Additional mineralization was recently discovered immediately to the west by Government geologists (showing No. 5 on Fig. 34).

WORK DONE: Geochemical soil and sediment survey covering Winn 7-9, 16-20; trenching on Winn 1-6, 7-16.

JAN, WL (No. 31, Fig. D)

LOCATION: Lat. 54° 10.2′-13.4′ Long. 126° 36.6′-41′ (93L/2E)
OMINECA M.D. At the northern tip of the Parrott Lakes, 14 miles south of Houston.

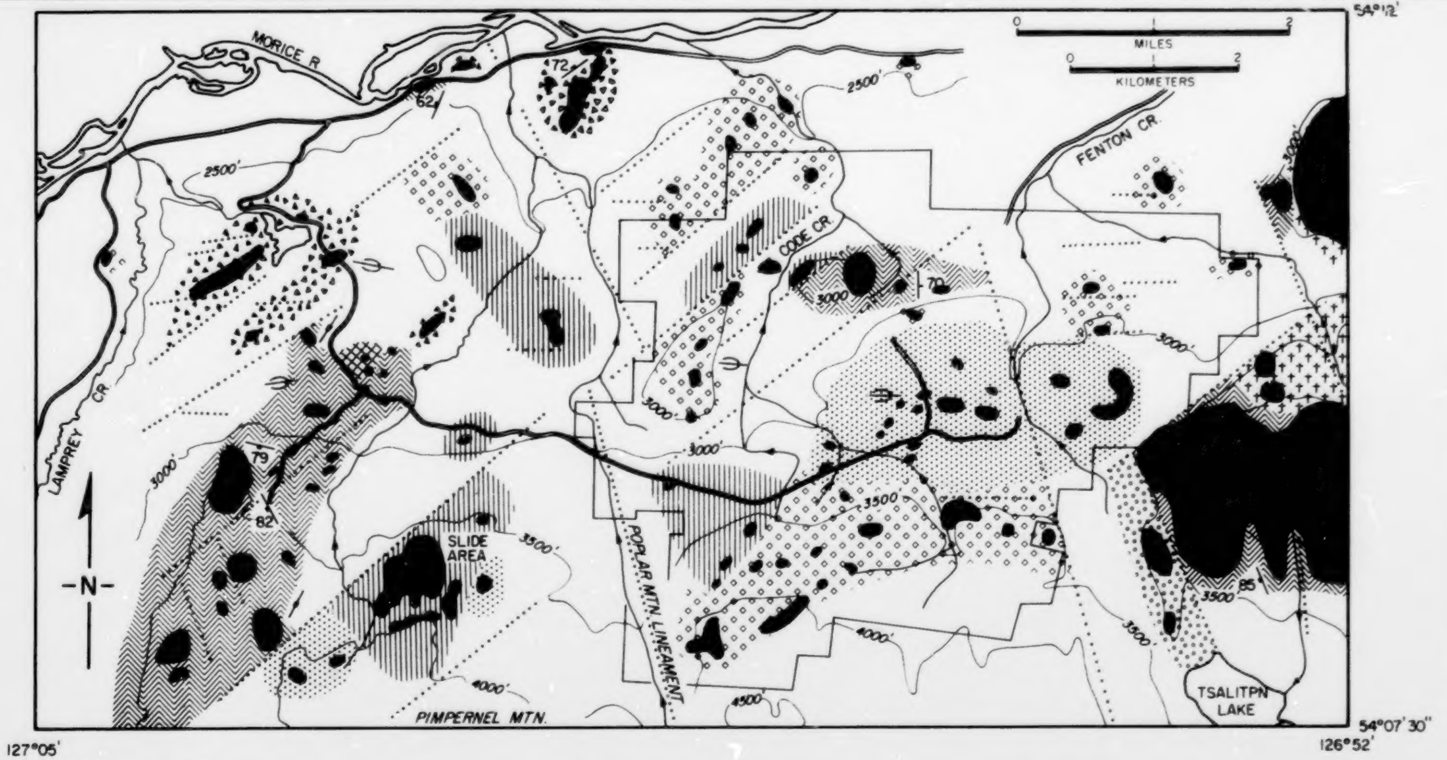
CLAIMS: JAN, WL, GROG, GOOF, TUNA, FISH, MISC, totalling approximately 157.

ACCESS: By the Buck Creek and Parrott Lakes road from Houston.

OPERATOR: SOLOMON DEVELOPMENT LTD., 9th Floor, 850 West Hastings Street, Vancouver 1.

WORK DONE: Induced polarization survey covering 63 line-miles; geological mapping, 1 inch equals 1,000 feet; geochemical soil survey, approximately 200 samples.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 131; Assessment Reports 3766, 4109.


MORICE R
72
62
2500'
0 1 2
MILES
0 1 2
KILOMETERS
FENTON CR.
CODE CR.
70
3000'
2500'
LAMPREY CR.
3000'
79
82
-N-
SLIDE AREA
3500'
3000'
3500
POPLAR MTN. LINEAMENT
4000'
3500
85
3500
TSALITPN LAKE
4000'
4500
PIMPERNEL MTN.
54°12'
54°07'30"
127°05'
126°52'

BEDDED ROCKS

TERTIARY

░ FENTON CREEK VOLCANIC ROCKS: RHYOLITE AND TRACHYTE BRECCIA AND GLASSY LAVA

▥ BUCK CREEK VOLCANIC ROCKS?: MAINLY FRESH BROWN APHANITIC ANDESITE

UPPER MESOZOIC

▦ TIP TOP HILL VOLCANIC ROCKS?: DACITIC PYROCLASTIC ROCKS AND LAVAS

░ SEDIMENTARY ROCKS; MAINLY SANDSTONE, LOCALLY RUST-COLOURED

LOWER OR MIDDLE MESOZOIC

▨ HAZELTON GROUP: MAINLY MAROON AND BROWN ANDESITIC AND DACITIC PYROCLASTIC ROCKS AND/EPIDOTE-BEARING MOTTLED GREY-GREENISH ANDESITE AND BASALT AND MINOR RHYOLITE

IGNEOUS INTRUSIONS

TERTIARY

✝ OWEN HILL GRANITE

MESOZOIC

▩ SMALL GABBRO STOCK

SYMBOLS

BEDROCK EXPOSURE .... ●

BEDDING ATTITUDE .... ┬

MAIN JOINT SET; VERTICAL, INCLINED ....

GLACIAL STRIAE ....

TOPOGRAPHIC LINEAMENT .... ⋯

BOUNDARY-CODE-FEN CLAIM BLOCK ....

TOPOGRAPHIC CONTOUR .... 4000'

SMALL STREAM ....

ROAD ....

Figure 40
GEOLOGY
OF THE
CODE CREEK AREA

(93L/2W)

POPLAR (No. 13, Fig. D)

LOCATION: Lat. 54° 01′ Long. 126° 58.5′ (93L/2W)
OMINECA M.D. At 6,000 feet elevation on the northern side of Tagetochlain Lake, 3 miles south of Poplar Mountain, 30 miles south-southwest of Houston.

CLAIMS: POPLAR 1 to 38, POPLAR 1 Fraction.

ACCESS: By road from Houston, 49 miles.

OWNER: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.

DESCRIPTION: The claims are underlain by Hazelton volcanic and sedimentary rocks.

WORK DONE: Geological mapping, 1 inch equals 200 feet and geochemical soil survey, 2,231 samples during 1971; geological mapping 1 inch equals 200 feet and trenching, 3,770 feet on Poplar 1, 2, 4, 6, and 10 during 1972.

REFERENCE: Assessment Report 3665.

CODE, FEN (No. 89, Fig. D)

By B. N. Church

LOCATION: Lat. 54° 10.2′ Long. 126° 57′ (93L/2W)
OMINECA M.D. At approximately 3,000 feet elevation northwest of Nadina Mountain, 2 to 4 miles south of Morice River.

CLAIMS: CODE, FEN, COF, totalling 148.

ACCESS: By road from Houston, 25 miles.

OWNER: Anaconda American Brass Limited.

OPERATOR: HELICON EXPLORATIONS LIMITED, 1520 Alberni Street, Vancouver 5.

METALS: Silver, lead, zinc.

DESCRIPTION:

INTRODUCTION: A study of the geology of the Tsalit Mountain and the Code property, described in Geology, Exploration, and Mining in British Columbia, 1970, has been extended westward in response to an increase in exploration activity in the area. This report concerns the results of field work completed by the writer in the latter part of July and early August 1971 plus a brief visit to the area in the summer of 1972.

PHYSIOGRAPHY: The map-area is a 50-square-mile strip of sloping terrain of modest relief lying just south of Morice River (elevation about 2,200 feet) and east of Lamprey Creek (Fig. 40).

Code Creek, a small tributary of the Morice, springs from the low marshy central section of the map-area, the area of recent and current prospecting interest. This stream is paralleled just to the east by Fenton Creek which drains the westerly slopes of Owen Hill and Tsalit Mountain near the east boundary of the map-area. Tributaries of an unnamed stream drain the area west of Code Creek including the north slope of Pimpernel Mountain near the south boundary (the highest topographic feature with an elevation of about 5,000 feet).

The last pulse of regional Pleistocene glaciation moved easterly across the area scraping the high bedrock exposures leaving a mean striation direction of 094 degrees. Blankets of morainal debris accumulated in numerous small valleys and depressions. Granite boulders strewn westward from Owen Hill and Tsalit Mountain are believed to be the product of a period of local valley glaciation which postdated the last regional ice advance. Residual valley glaciers on the northerly slopes of Nadina and Tsalit Mountains at first drained westerly, as recorded by esker-like sand and gravel deposits near the headwaters of Code Creek, then northerly where meltwaters eventually carved a deep gully into outwash sands along the course of Fenton Creek.

A peculiar area of hummocky terrain noted near the 3,500 feet contour of Pimpernel Mountain does not appear to be due to glacial activity. This may be a side deposit resulting from a seismic event centred somewhere on the extensive fracture system known to traverse the region.

The area once heavily wooded below the 4,000-foot elevation level has been extensively logged in recent years. As a result the west-central and northeastern parts are clear cut in places and now provide excellent summer grazing land for wild animals.

PROSPECTING HISTORY: In June 1965 Julian Mining Co. Ltd. located a block of 20 claims in response to the discovery of a silver-lead-zinc geochemical anomaly on Code Creek. After some preliminary work the company was joined by Anaconda American Brass Limited, in the years 1966 to 1971, in an intensive investigation which included induced polarization and magnetometer surveys, a silt-soil geochemical programme, and geological mapping. Other supporting work includes line-cutting, bulldozer trenching, and construction of an extensive system of access roads.

In 1972 Helicon Explorations Limited resumed this investigation with detailed induced polarization and Afmag surveys and more geochemical sampling. This concluded with a diamond-drill programme of 25 holes totalling 11,000 feet in a target area in the north-central part of the property.

GENERAL GEOLOGY: The bedded units are mainly volcanic comprising rocks thought to be part of the Hazelton assemblage, and cover rocks equivalent to the Tip Top Hill, Buck Creek, and younger Tertiary formations. Igneous intrusions consist of a granite stock, a small gabbroic intrusion, and an assortment of dykes.

Bedded Rocks: Rocks believed to be part of the Hazelton Group crop out near the east boundary, mainly on Tsalit Mountain, in the west and northwest parts, and locally in the north-central part of the map-area. Most of these rocks are mottled greenish grey and epidote bearing. They display vestiges of primary volcanic structures such as amygdales and breccia textures. A distinctive brownish maroon pyroclastic phase, commonly charged with small feldspar laths was found on the ridges east of Lamprey Creek and near the main access roads in the northwest part of the map-area.

A frequency plot of artificially prepared glass from representative samples shows a broad composition range consisting of 35 per cent basalt, 20 per cent andesite, 20 per cent dacite, and 15 per cent rhyolite (Fig. 41).

Some shaly beds, apparently intercalations in the Hazelton volcanic pile, were reportedly intersected by drilling in the central area. On the whole, however, these sedimentary facies are rarely exposed.

Rocks thought to be the equivalent of Tip Top Hill lavas and pyroclastics (Upper Cretaceous) are seen on the bluffs and ridges in the south part of the Code-Fen property, on numerous knolls and low ridges near the northwest corner of the claim block, and to lesser extent on the northeast claims.

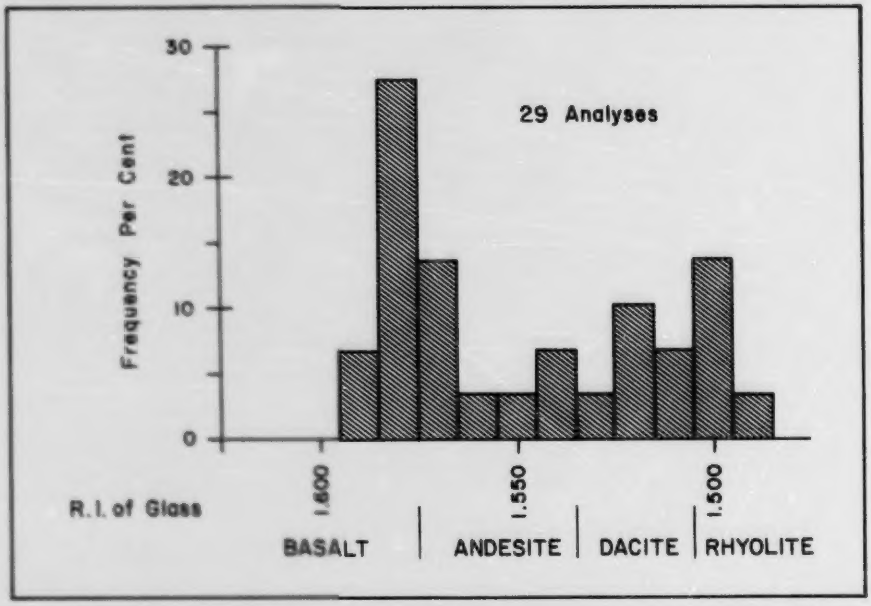


Figure 41. Frequency plot of refractive index determinations on fused Hazelton volcanic rocks from the Code Creek area.

Generally the rocks are light or medium brown, often somewhat rusted on weathered surfaces. The most common phase has numerous small feldspar laths 1 to 3 millimetres long mixed with a few hornblende prisms and biotite books. Arc fusion analysis performed on 15 samples shows that the rocks are essentially dacites having an average refractive index of 1.517.

A wedge of sedimentary rock, mainly brown quartz feldspar wacke, is exposed on a low ridge just northwest of Tsalitpn Lake at the western extremity of Tsalit Mountain. These rock are well indurated, however, unlike many Hazelton units there is little evidence of cataclasis. The relative stratigraphic position of these beds is in doubt. It appears that the material was initially deposited prior to the eruption of much volcanic debris in Late Cretaceous time. It seems clear from the petrography of this rock that the clastics were derived at least in part from a granitic provenance; a terrain soon to be covered with thick volcanic accumulations.

Tertiary volcanic rocks tentatively correlated with the Eocene Houston phase of the Buck Creek assemblage are exposed on scattered knolls in the central part of the map-area and on the slopes of Pimpernel Mountain to the south. These lavas and volcanic breccias are commonly medium or dark brown and aphanitic. In thin section the rocks are found to consist largely of tiny plagioclase microlites and clusters of small pyroxene crystals in a glassy matrix. X-ray analysis shows an average of less than 2 per cent quartz; this is in contrast with the older volcanic rocks of the area which range to as much as 40 per cent quartz in some cases. Arc fusion analysis of 10 samples shows that the rocks are typically andesitic having an average refractive index of 1.552.

TABLE OF CHEMICAL ANALYSES

Oxides Recalculated to 100 –

	1	2
SiO_2	78.08	74.4
TiO_2	0.10	0.3
Al_2O_3	13.78	13.7
Fe_2O_3	0.49	1.5
FeO	0.08	0.9
MnO	0.04	0.1
MgO	0.56	0.4
CaO	2.32	1.2
Na_2O	2.94	3.4
K_2O	1.61	4.5
	100.00	100.0

Oxides as Determined –

	1
SrO	0.13
BaO	0.07
H_2O+	9.80
H_2O-	5.48
CO_2	0.02
P_2O_5	0.02
SO_3	0.01

1 – Glassy rhyolite from a road cut west of Fenton Creek; analysis by R. S. Young, British Columbia Department of Mines and Petroleum Resources.

2 – Daly's 1933 average rhyolite composition, Table 1, No. 5.

The youngest formation, here tentatively named 'Fenton Creek volcanic rocks,' is found mainly in a 1.5 by 2.5-mile laterally elongated zone in the east-central part of the map-area. This unit consists of volcanic breccias, lava, tuff, and dykes, that are very fresh and probably of post-Miocene age. In places, especially east of Fenton Creek, the unit is mostly glassy rhyolite lava and breccia (*see* the accompanying chemical analysis); immediately to the northwest this volcanic complex changes to predominantly feldspar porphyry trachyte and to the south to quartz porphyry rhyolite. Arc fusion analysis of three samples of trachyte gives an average refractive index of 1.492.

A few scattered outliers of similar rocks possibly related to the trachyte are found on Pimpernel Mountain.

Intrusive Igneous Rocks: The Owen Hill granite, the largest intrusion in the map-area, outcrops at the east boundary where it cuts Hazelton volcanic rocks. This is a medium-grained leucocratic stock probably correlative with the young (Tertiary) plutonic bodies on Nadina Mountain.

Modal analysis of seven samples shows the following composition:

Quartz	29 per cent
Perthitic orthoclase	27 per cent
Plagioclase (zoned, mainly oligoclase)	39 per cent
Biotite Chlorite Magnetite Apatite	5 per cent

It is noted that if the albite component of the plagioclase is removed it will combine in roughly equal proportions with the orthoclase and quartz with total residuals less than 20 per cent. According to Tuttle and Bowen (1958, pp. 127, 128) such rocks which approach eutectic or thermal minimum composition must be unequivocably classed as true granites as distinguished from other rocks of the granite clan.

The only other intrusion worthy of description is a small fine to medium-grained gabbroic stock, about one-quarter mile in diameter, found cropping out just northeast of the main access logging road in the west-central part of the map-area. Thin section study of two samples of a feldspathic phase of this rock shows an average of 85 per cent plagioclase (An_{40} to An_{50}), 14 per cent pyroxene and equivalent alteration products, and 1 per cent magnetite and other accessories. A minor occurrence of chalcopyrite has been reported in the vicinity of this body.

STRUCTURAL GEOLOGY: The area is characterized by a reticulate pattern of small valleys and draws which evidently mark a system of important fractures. The so-called Poplar Mountain lineament which originates near the centre of the map-area is the most conspicuous regionally. This line can be traced approximately 15 miles to the southeast, striking about 165 degrees, to Tagetochlain Lake. It sharply defines the west side of Poplar Mountain which proves to be a large fault block. Somewhat weaker subparallel lineaments are observed near Tsalitpn Lake and Tsalit Mountain.

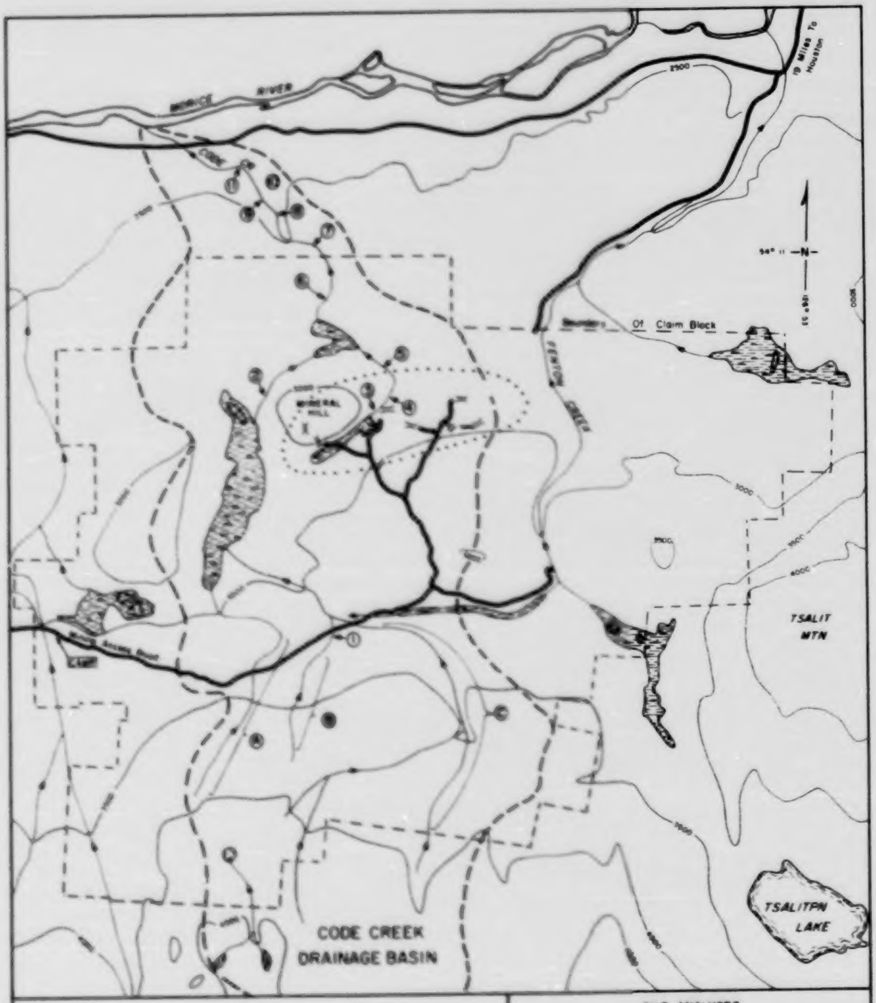
A second series of prominent lineaments coincides with a number of small but important faults trending about 050 degrees. Movement on these has chopped the geology in the northwest sector into a number of northeasterly elongated panels. Some offset in the northern extension of the Poplar Mountain lineament is also apparent.

Examination of the data gathered in the field shows the prevalence of minor fractures. The main attitudes are as follows:

Development	Attitude
(1) Very strong	strike 100 degrees, dip 90 degrees
(2) Strong	strike 140 degrees, dip 80 degrees southwest
(3) Intermediate	strike 025 degrees, dip 60 degrees northwest
(4) Weak	strike 065 degrees, dip 80 degrees northwest

The strongest direction (1) is parallel to a set of well-developed easterly trending lineaments. (These are readily confused with glacial grooves displayed by photographs.) The remaining fractures cannot be easily correlated with known lineament directions, possibly because of the extent of glacial cover in the area and limitations in photographic resolution.

MINERALIZATION: The zone of mineralization on the Code-Fen property is coincident with an elliptical window of Hazelton acid pyroclastic rocks about 0.5 mile wide extending 1.2 miles eastward from Mineral Hill and centred about 1.5 miles south of the Morice River road (Fig. 40). Owing to extensive till deposits in this region visible bedrock is restricted to trenches, a few areas near the crest of Mineral Hill, and along Code Creek. Where exposed the rocks are uniformly bleached dacitic tuffs and tuff breccias; these appear to be massive except just southeast of the gully on the east fork of Code Creek where a section of well-bedded tuff was found striking 005 degrees dipping 65 degrees easterly. Fine-grained pyrite and dark specks of sphalerite are widely disseminated accompanied by intense clay alteration, silicification in places, and manganese encrusta-


MORICE RIVER
CODE CR
19 Miles To Houston
2500
Boundary Of Claim Block
MINERAL HILL
TSALIT MTN
TSALITPN LAKE
CODE CREEK DRAINAGE BASIN
N
3000
3500
4000
Morice Access Road

LEGEND

Stream
Swamp
Road
Trench
River
Hazelton Window
Pond
⑤ Silt Station
Drainage Divide
Topographic Contour

SILT ANALYSES

No.	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mn ppm
1	0.8	40	21	95	600
2	1.0	24	25	135	1400
3	3.7	60	233	525	2600
4	4.1	80	215	500	1900
5	4.2	24	165	670	4700
6	1.3	24	28	176	1500
7	0.8	18	20	150	1500
8	0.6	17	12	100	1300
9	0.7	22	15	110	1500
10	0.7	22	14	105	1200
11	0.6	17	16	98	800
A	0.6	27	14	71	822
B	0.4	13	10	56	522
C	0.5	16	10	74	486

Analyses 1 to 11 inclusive by S Metcalfe, British Columbia Department of Mines; A, B, and C are averages on 10, 4, and 11 samples respectively determined by Anaconda American Brass Limited

Figure 42. Analyses of silt samples taken in the Code Creek drainage basin.

tion on cracks. A few narrow veinlets of dark sphalerite and pyrite are visible in some samples.

Knowledge of the nature and origin of the mineralization is incomplete. No igneous intrusion has been found in the immediate area that could be attributed as being the source of metal-bearing solutions. In fact the only intrusions known to cut Hazelton rocks are fresh Tertiary dykes that certainly postdate mineralizing events. (Scattered pyrite reported as occurring in the quartz porphyry phase of the Fenton Creek rhyolite is not considered part of or related to the main mineralization.)

SILT AND SOIL GEOCHEMISTRY: The results of a silt geochemical survey in the Code Creek drainage basin is shown on Figure 42. A total of 11 samples were collected by the writer and submitted for acid extraction treatment and atomic absorption analysis.

The determinations show a regular increase in silver passing upstream from a point near the mouth of Code Creek (station 11) to its east fork tributary approaching the Hazelton window (stations 3, 4, and 5). The behaviour of zinc is markedly similar to silver as is lead and manganese; copper is somewhat erratic. Average background readings established from stations on the upper reaches of Code Creek (Nos. 1, A, B, and C) are as follows: 0.6 ppm silver, 24 ppm copper, 14 ppm lead, 74 ppm zinc, and 608 ppm manganese. The highest values, all from stations 3, 4, and 5, are: 4.2 ppm silver, 80 ppm copper, 233 ppm lead, 670 ppm zinc, and 4,700 ppm manganese.

Detailed soil sampling in the area of the Hazelton window shows good geochemical coherence between lead and zinc and to a certain extent, silver. According to a company report the results of a total of 395 samples (normally taken from 'B' horizon) shows lead greater than 60 ppm and ranging to 1,000 ppm in 74 samples and zinc greater than 700 ppm and ranging to 2,000 ppm in 75 samples. Copper levels rarely exceed 75 ppm and are nowhere considered anomalous. The threshold level for silver has been set at 1.7 ppm in this area; in a few soil samples silver attains values in excess of 16 ppm.

WORK DONE: Surface workings mapped; induced polarization survey, 5 line-miles covering central area of the Code-Fen claims; Afmag survey, 2.5 line-miles covering the same claims; geochemical soil survey, 270 samples covering the same claims; surface diamond drilling, 25 holes totalling 11,000 feet on Code 6-9, 12, 13, 15, 21 Fraction and Fen 1.

REFERENCES: *Minister of Mines, B.C.* Ann. Rept., 1965, p. 81; 1967, p. 109; 1968, p. 139; *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, pp. 149, 150; 1971, p. 173; Assessment Reports 799, 1229, 2734, 3257, 3646; Tuttle, O. F. and Bowen, N. L., 1958, *Geol. Soc. Amer.*, Mem. 74, p. 153.

HAGAS (No. 104, Fig. D)

LOCATION: Lat. 54° 09'-10.8' Long. 126° 59' - 127° 02' (93L/2W, 3E)
OMINECA M.D. At approximately 3,000 feet elevation 2 miles southeast of the junction of Morice River and Lamprey Creek, 25 miles southwest of Houston.

CLAIMS: HAGAS 1 to 37, HR 1 to 10.

ACCESS: By the Morice River road from Houston, 25 miles.

(93L/4E)

OPERATORS: PERRY, KNOX, KAUFMAN, INC., Box 14336, Spokane, Wash. and SUN OIL COMPANY, 503 North Central Expressway, Richardson, Texas.

METALS: Zinc, copper.

DESCRIPTION: Several weak showings of zinc and copper mineralization are related to fracturing in Hazelton volcanic rocks.

WORK DONE: Perry, Knox, Kaufman, Inc. – geochemical soil survey, 175 samples covering approximately 10 claims; Sun Oil Company – electromagnetic survey.

REFERENCE: Assessment Report 4194.

LORI (No. 149, Fig. D)

LOCATION: Lat. 54° 04.9′ Long. 127° 40.9′ (93L/4E)
OMINECA M.D. At approximately 5,500 feet elevation 1.5 miles north of the peak of Mount Loring, about 4 miles northwest of Morice Lake, 48 miles southwest of Houston.

CLAIMS: LORI 1 to 6.

ACCESS: By helicopter from Houston, 48 miles.

OPERATOR: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The claims are underlain by Hazelton volcanic and sedimentary rocks intruded by granitic plugs and stocks. Chalcopyrite and pyrite are found in occasional shears and as weak disseminations in strongly epidotized volcanic rocks. Bornite and chalcopyrite occur as fine disseminations in one fault zone adjacent to a volcanic-intrusive contact.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet covering Lori 1-6.

R (No. 103, Fig. D)

LOCATION: Lat. 54° 04.5′-07.3′ Long. 127° 32′-37.6′ (93L/4E)
OMINECA M.D. Between 4,000 and 6,000 feet elevation 3 miles north of Morice Lake, between Nanika and Loring Mountains.

CLAIMS: R 1 to 8, 11 to 14, 19 to 100.

ACCESS: By helicopter from Smithers, approximately 50 miles.

OWNER: AMOCO CANADA PETROLEUM COMPANY LTD., 2160, 1055 West Hastings Street, Vancouver 1.

WORK DONE: Surface geological mapping, 1 inch equals one-quarter mile and geochemical soil, rock, silt, and water survey, 467 samples covering all claims.

MO (No. 150, Fig. D)

LOCATION: Lat. 54° 10′ Long. 127° 33′ (93L/4E)
OMINECA M.D. At approximately 4,500 feet elevation on a tributary of Gosnell Creek, 2 miles west of Nanika Mountain forestry lookout, 42 miles southwest of Houston.

(93L/4E, 5E)

CLAIMS: MO 1 to 14.

ACCESS: By helicopter from Houston, 42 miles.

OWNER: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: Narrow shear zones in a granitic intrusion are mineralized with chalcopyrite, pyrite, and molybdenite.

WORK DONE: Reconnaissance surface geological mapping, 1 inch equals 1,000 feet covering all claims.

RED (No. 106, Fig. D)

LOCATION: Lat. 54° 13'-17.4' Long. 127° 35'-41' (93L/4E, 5E)
OMINECA M.D. Between 3,500 and 6,500 feet elevation at the peak and on the northeast slope of Herd Dome, approximately 45 miles south-southwest of Smithers.

CLAIMS: RED 1 to 104, VA 501, 502, 505 to 508, 521 to 544.

ACCESS: By helicopter from Smithers, approximately 45 miles.

OWNER: AMOCO CANADA PETROLEUM COMPANY LTD., 2160, 1055 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Rocks in the area are red intermediate to basic volcanic flows, flow breccias, minor tuff beds, and pyroclastic, sedimentary, and green volcanic rocks.

WORK DONE: Surface geological mapping, 1 inch equals one-quarter mile and geochemical soil, rock, silt, and water survey, 375 samples covering all claims.

FOG (No. 45, Fig. D)

LOCATION: Lat. 54° 08.8' Long. 127° 54.0' (93L/4W)
OMINECA M.D. At 6,000 feet elevation covering Hope Peak, approximately 52 miles southwest of Smithers.

CLAIMS: SAL 1 to 36.

ACCESS: By helicopter from Smithers, 52 miles.

OWNER: THE SWISS ALUMINIUM MINING CO. OF CANADA LTD., Box 835, Station A, Vancouver 1.

METAL: Copper.

DESCRIPTION: Hazelton Group volcanic and sedimentary rocks are found in contact with monzonitic stocks and plugs. These rocks are intruded by extensive aplitic dyke swarms. Gossan zones with copper sulphides are associated with the volcanic rocks.

WORK DONE: Topography and surface workings mapped; surface geological mapping, 1 inch equals 10,000 feet.

REFERENCE: Assessment Report 3875.

TEL (No. 175, Fig. D)

LOCATION: Lat. 54° 29′ Long. 127° 40′ (93L/5E)
OMINECA M.D. Near the headwaters of Telkwa River, 27 miles southwest of Smithers.
CLAIMS: TEL 29 to 38, 51 to 60.
ACCESS: By helicopter from Smithers, 27 miles.
OWNER: TYEE LAKE RESOURCES LTD., 1930, 1055 West Hastings Street, Vancouver 1.
METALS: Copper, silver.
DESCRIPTION: Copper-silver mineralization occurs in Lower Jurassic volcanic rocks adjacent to a small granitic stock.
WORK DONE: Geochemical soil survey.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* Map 69-1, Geological Compilation of Hazelton, Smithers, and Terrace Areas; Assessment Report 4191.

WAR EAGLE (No. 5, Fig. D)

LOCATION: Lat. 54° 25′ Long. 127° 24′ (93L/6W)
OMINECA M.D. Three-quarters of a mile south of Howson Creek, 23 miles southwest of Telkwa.
CLAIMS: WAR EAGLE, CARY, SQ, PR, totalling 28.
ACCESS: By four-wheel-drive vehicle road from Telkwa, approximately 23 miles.
OWNER: PATHFINDER RESOURCES LTD., 617, 789 West Pender Street, Vancouver 1.
METALS: Copper, silver.
DESCRIPTION: Chalcopyrite and bornite occur in narrow quartz veinlets and shears in altered Hazelton volcanic rocks.
WORK DONE: Geological and geochemical surveys during 1970.
REFERENCES: Assessment Reports 917-919, 929, 3485.

TOM (No. 105, Fig. D)

LOCATION: Lat. 54° 29′ Long. 127° 28′ (93L/6W)
OMINECA M.D. At approximately 5,000 feet elevation south of Scallon Creek, 25 miles southwest of Telkwa.
CLAIMS: TOM 1 to 18.
ACCESS: By road from Telkwa, 35 miles.
OWNER: MAHARAJA MINERALS, LIMITED, 1102, 207 West Hastings Street, Vancouver 3.
METAL: Copper.
DESCRIPTION: Essentially narrow irregular shears with veins of quartz replacement and sulphide mineralization are found in epidotized and chloritized buff, reddish, and green fine-grained andesitic tuffs and/or flows of the Hazelton Group.
WORK DONE: Trenching, 1,000 feet on Tom 4, 6, and 8.

JOE (No. 43, Fig. D)

LOCATION: Lat. 54° 23' Long. 127° 13' (93L/6E)
OMINECA M.D. At 5,000 feet elevation on Loljuh Creek, 23 miles west of Houston.

CLAIMS: JOE, totalling 58.

ACCESS: By helicopter from Houston, 23 miles.

OWNER: LOBELL MINES LIMITED, 2706, 614 Fifth Avenue SW., Calgary, Alta.

METALS: Silver, copper, lead, zinc.

WORK DONE: Induced polarization survey and geochemical soil survey covering Joe 1-16, 46, 48-50, 52, and 54.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 150; Assessment Report 3874.

ROCK (No. 46, Fig. D)

LOCATION: Lat. 54° 23' Long. 127° 15' (93L/6E)
OMINECA M.D. At approximately 4,500 feet elevation on Loljuh Creek, 23 miles west of Houston.

CLAIMS: ROCK 107 to 114, 134, 135, ROCK 1 Fraction.

ACCESS: By helicopter from Smithers, 28 miles.

OWNER: NORANDA MINES, LIMITED, 1050 Davie Street, Vancouver 5.

METALS: Copper, molybdenum.

WORK DONE: Geochemical rock survey.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 173; Assessment Report 3809.

DOMINION (No. 93, Fig. D)

LOCATION: Lat. 54° 28' Long. 127° 10' (93L/6E)
OMINECA M.D. At approximately 6,000 feet elevation on Denys Creek in the Telkwa Mountain range.

CLAIMS: DOMINION 1 and 2, DOME 1 to 17.

ACCESS: By helicopter from Smithers, 24 miles.

OWNER: MAHARAJA MINERALS, LIMITED, 1102, 207 West Hastings Street, Vancouver 3.

METAL: Copper.

DESCRIPTION: The mineralization consists primarily of chalcopyrite and chalcocite in Hazelton volcanic rocks.

WORK DONE: Trenching, 100 feet on Dome 7.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 87.

JW (No. 157, Fig. D)

LOCATION: Lat. 54° 25.5'-27' Long. 126° 47'-51' (93L/7W)
OMINECA M.D. West of Barrett station on the Canadian National Railway, 6 miles northwest of Houston.

(93L/7E)

CLAIMS: JW 1 to 32.

ACCESS: By road from Smithers, 26 miles.

OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

DESCRIPTION: There are no bedrock exposures on the claim block; however, percussion drilling indicates that the claims are underlain mainly by Jurassic volcanic rocks.

WORK DONE: Percussion drilling, six holes totalling 1,630 feet on JW 3, 14, 15, 26, and 31.

STAR, KLONDIKE (HOT, CHIEF) (No. 145, Fig. D)

By B. N. Church

LOCATION: Lat. 54° 22' Long. 126° 34' (93L/7E)
OMINECA M.D. At 3,150 feet elevation near Dungate Creek, 4 miles southeast of Houston.

CLAIMS: HOT 1 to 14, HOT 1 Fraction, CHIEF 2, 9, 10.

ACCESS: About 6 miles by good gravel and dirt roads from Houston.

OWNER: R. Blusson.

OPERATOR: CHINOOK RESOURCES LTD., 30, 448 Seymour Street, Vancouver 2.

METALS: Copper, molybdenum.

DESCRIPTION:

INTRODUCTION: This property, formerly known as the Klondike-Star claim group, appears to be the focus of renewed exploration activity. The area is in a belt of scattered sulphide mineralization in the northwest part of the Buck Creek map-area (Fig. 34), the centre of current attention being the Dungate Creek porphyry prospect. The present report is an attempt to bring together data gathered by the writer during a visit to the area in July 1972 and information available in company reports.

HISTORY: The Initial discovery of chalcopyrite and molybdenite was made in a shallow excavation on the newly constructed Dungate Creek logging road about 1962. Subsequent trenching parallel to the road failed to reveal any important extension of the mineralization and the owners allowed the claims to lapse.

In July 1964, E. Westgarde of Houston restaked the showing. Additional claims were staked in 1965 and the property was then optioned to Southwest Potash Corporation. A period of detailed exploration followed which included a magnetometer survey, a limited programme of soil and rock geochemistry, 3,000 feet of bulldozer trenching, and geological mapping.

Early in 1966 Normont Copper Ltd. gained control of the property and initiated a new phase of investigation. Anco Exploration Ltd. was contracted for general field work including a geochemical survey and in the fall of the same year Huntec Ltd. completed an induced polarization survey. In 1967, Chapman, Wood and Griswold Ltd., under the supervision of Dr. S. W. Ward, ran another detailed induced polarization survey to locate diamond-drill targets. Normont optioned the property to Noranda Exploration Company, Limited in December 1967 and by April 1968 drilling began. The programme included seven AQ wireline drill holes, totalling 2,000 feet. Results were disappointing and the property remained dormant from 1969 to 1972.

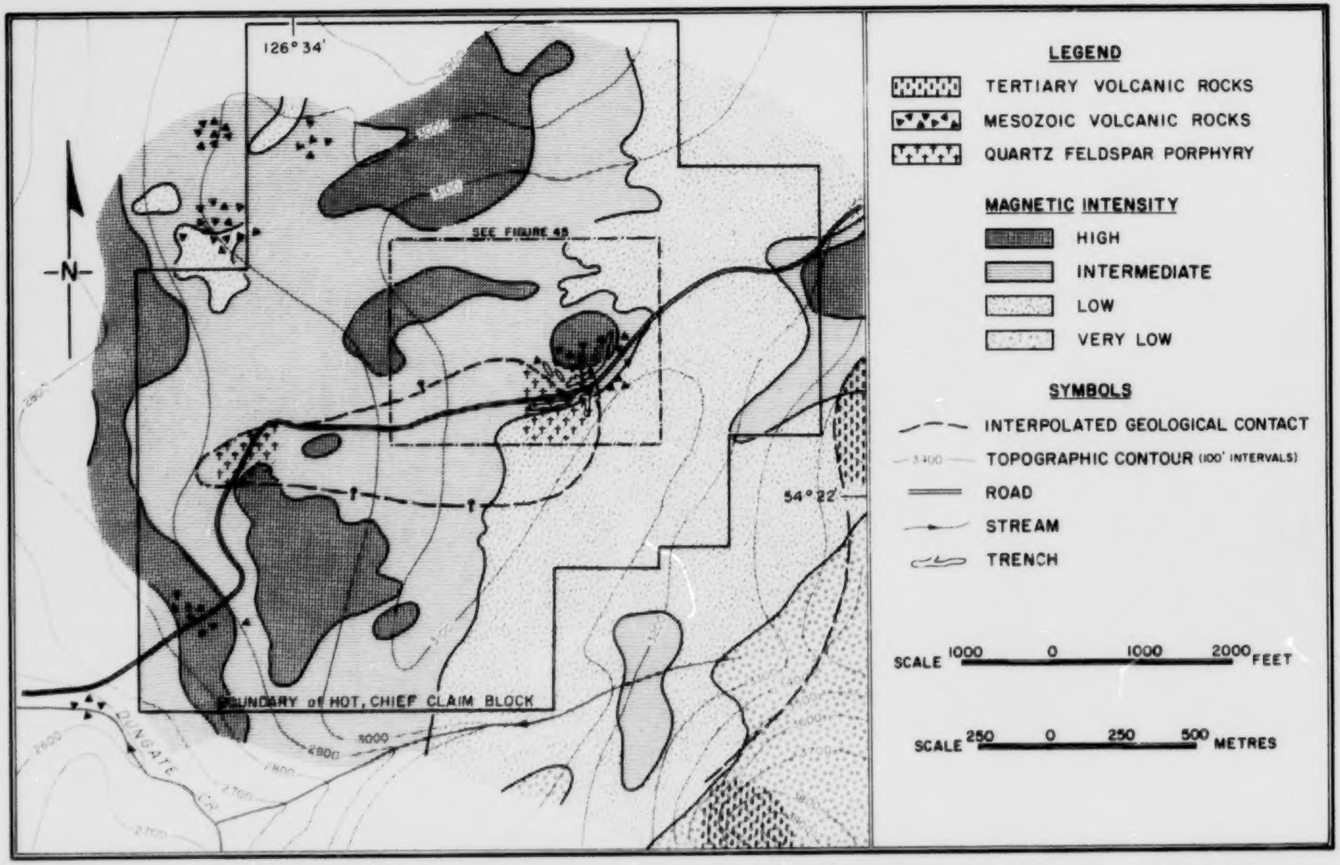

LEGEND
TERTIARY VOLCANIC ROCKS
MESOZOIC VOLCANIC ROCKS
QUARTZ FELDSPAR PORPHYRY
MAGNETIC INTENSITY
HIGH
INTERMEDIATE
LOW
VERY LOW
SYMBOLS
INTERPOLATED GEOLOGICAL CONTACT
TOPOGRAPHIC CONTOUR (100' INTERVALS)
ROAD
STREAM
TRENCH
SCALE 1000 0 1000 2000 FEET
SCALE 250 0 250 500 METRES
N
126° 34'
54° 22'
SEE FIGURE 45
BOUNDARY of HOT, CHIEF CLAIM BLOCK
DUNGATE CR.
2900
3000
3100
2800
2700
2600

Figure 43. Geology and magnetic plan of the Hot, Chief claims, Dungate Creek area. Magnetic interpretation largely from company plans.

In April 1972, R. Blusson restaked the Westgarde holdings for Chinook Resources Ltd. and another period of exploration is anticipated in 1973.

PHYSIOGRAPHY: The property is situated on a bench, at 3,150 feet elevation, midway up the north-facing slope of the Bulkley Valley overlooking the town of Houston which is at about 1,950 feet elevation.

In the vincinity of the main prospect bedrock exposures are few, the area being mantled by glacial till and outwash sand which, according to diamond-drill logs, averages about 20 feet thick. The best bedrock exposures are bluffs of nearly horizontal Tertiary lava immediately east and southeast of the property and a few low hills and knolls of Hazelton volcanic rocks near the west and northwest boundaries; a good section of Hazelton volcanic rocks is also exposed in Dungate Creek canyon near the southwest corner of the claim block.

The conspicuous topographic bench which underlies most of the property is evidently part of an exhumed erosion surface which is roughly coincident in elevation with the base of the adjacent Tertiary pile. Easterly moving glaciers were probably responsible for stripping away much of the Tertiary cover rocks. The mean glacial striae direction in the area is 083 degrees.

A mixed stand of spruce, pine, and balsam which once covered the area has been selectively logged and in some places completely cut. Between the few standing large trees, the scattered slash is enveloped in a dense growth of brush and mountain salad.

GENERAL GEOLOGY: Owing to exceedingly poor exposure, details on the geology of the property are lacking, however, some interpretation of bedrock can be gained from the few exposures on the property and surrounding areas, diamond-drill logs, and geophysical data.

Bedded Rocks: The oldest and predominant geological units in the area are believed to be part of the Mesozoic Hazelton Group. The suite is mainly volcanic although shales and greywacke are recorded in a few of the drill logs. The lavas and volcanic breccias exhibit both aphanitic and feldspathic phases and range in colour from dark to light grey, greenish grey, and light brown. The results of arc fusions and quartz determinations performed on a volcanic suite representing 20 geological stations in the area have been plotted on a special graph designed by the writer, Figure 44. This shows a bimodal composition distribution consisting of (1) basic and intermediate rocks: basalts and andesites, and (2) siliceous rocks: dacites and rhyolites.

The fortuitous combination of basic volcanic beds, presumably characterized by high magnetic susceptibility, and siliceous units, with low susceptibility, provides a base for interpretation of available magnetic data. Figure 43 shows the known geology superimposed on a magnetometer survey map. The most conspicuous features are the bands of magnetic highs alternating with lows. These bands strike northeast at about 020 degrees suggesting that this direction is in fact the strike of the underlying Hazelton Group. This interpretation is supported by the discovery of outcrops of siliceous lavas in the area of magnetic lows near the northwest boundary of the property and basic volcanic rocks exposed at the extremities of the broad magnetic high band in the southwest part of the property and beyond the north boundary east of Mud Lake.

The area of very low magnetic response in the southeast corner of the map-area appears

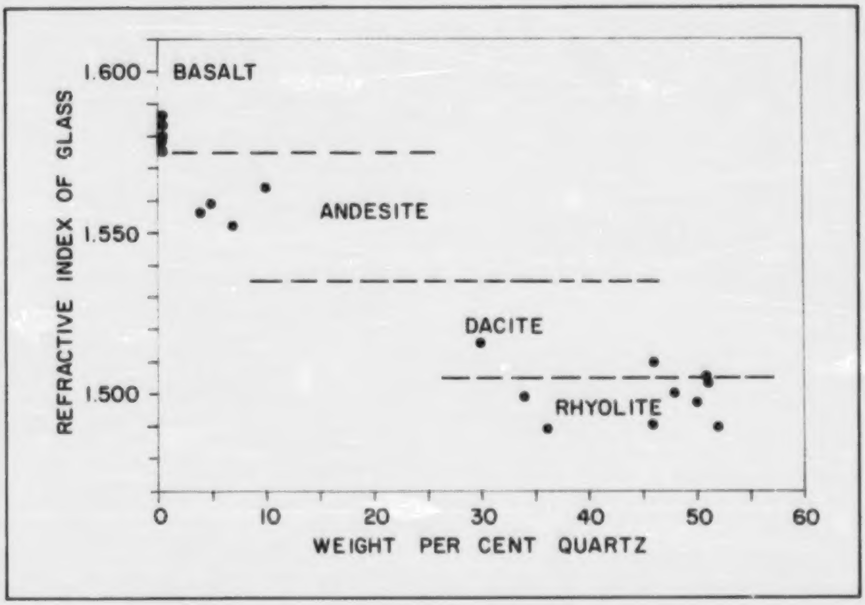


Figure 44. Refractive index – quartz variations of fused Hazelton volcanic rocks from the Dungate Creek area.

to be, at least in part, a dipole edge effect caused by the Tertiary volcanic pile lapping onto the Hazelton rocks. The Tertiary succession here consists of a few hundred feet of typical feldspar porphyry Goosly Lake trachyandesite lavas overlain by many hundreds of feet of brown aphanitic Buck Creek dacitic andesite volcanic breccias.

Intrusive Rocks: Biotite quartz feldspar porphyry is exposed in trenches in the main prospect area in the east central part of the property and on the logging road 3,500 feet to the west. No natural exposures are known and the outline of the intrusion shown on Figure 43 is wholly based on the interpretation of company geologists. This model appears to be somewhat oversimplified in view of the discovery of similar porphyry in some of the outlying drill holes.

Typically the rock is cream-grey on freshly broken surfaces and rust-brown where weathered. The most common phase contains about 30 per cent subhedral plagioclase phenocrysts ranging from 1.5 to 7 millimetres in diameter and a few scattered quartz eyes and biotite books embedded in a fine-grained groundmass. A partial analysis of this rock obtained from a company report shows 3.20 per cent potash, 3.50 per cent soda, and 1.15 per cent lime. According to norm calculations this would yield about 19 per cent orthoclase, 30 per cent albite, and 6 per cent anorthite. Evidently the alkali feldspar is almost entirely a groundmass constituent.

Another less common phase of the intrusion is characteristically charged with small plagioclase phenocrysts which seldom exceed 2 millimetres in diameter; these comprise about 40 per cent of the volume of the rock. There is some suggestion that this rock is an apophysis or a dyke offshoot phase of the main porphyry body.

MINERALIZATION: The main area of mineralization is shown on Figure 45. This consists primarily of pyrite and subordinate chalcopyrite occurring as thin fracture fillings and fine-grained disseminations in the porphyry intrusion and adjacent volcanic rocks. Molybdenite is found in minor amounts as thin smears on fractures at the edge of the intrusion.

Alteration of the porphyry has resulted locally in conversion and, in places, the complete breakdown of feldspar – albitization and carbonatization of plagioclase phenocrysts and sericitization and kaolinization of the fine-grained constituents. Biotite is commonly slightly chloritized and hornblende, where it occurs, is generally converted to magnetite and chlorite.

A well-developed zone of intense silicification, about 100 feet wide, is found immediately adjacent to the northeast contact of the porphyry in the northeast trench. Here a system of composite reticulate quartz veinlets has been emplaced by repeated injections of hydrothermal solutions. Numerous cherty quartz seams, each not more than a few centimetres wide, are separated by narrow screens and wedges of intensely altered fine-grained country rock which is discoloured by a reddish yellow hematite-limonite mixture.

The most common jointing in the porphyry intrusion and surrounding Hazelton rocks strikes northeasterly; a very persistent steeply dipping joint set trends about 070 degrees subparallel to the zone of silicification (Fig. 46). A weaker nearly vertical cross-fracture set strikes southeasterly.

Diamond drilling by Noranda was designed to test geochemical response and various geophysical anomalies. According to company records holes Nos. 1, 2, and 3 were drilled to test combinations of induced polarization and magnetic anomalies; holes Nos. 4, 5, 6, and 7 were intended to test various combinations of induced polarization, magnetic, electromagnetic, and geochemical anomalies.

Holes Nos. 1 and 2, each 300 feet in length, cut what appeared to be altered porphyry with narrow seams of magnetite and minor chalcopyrite. A quartz-rich section of hole No. 2, between 240 and 260 feet, ran 0.28 per cent copper.

Holes Nos. 4 and 6, measuring 295 and 202 feet in length respectively, showed continuous intersections of pyrite-bearing porphyry. Chalcopyrite was scarce, the highest assay result showed only 0.14 per cent copper.

Holes Nos. 3, 5, and 7, all about 300 feet in length, had large intersections of poorly mineralized Hazelton rocks; Nos. 3 and 5 with mostly volcanic debris and No. 7, sedimentary rocks. The core from hole No. 3 showed an abundance of disseminated magnetite which probably accounts for a high magnetic anomaly in the area.

Six grab samples of mineralized bedrock were collected from the trenches by the writer (Fig. 45). Analysis of the porphyry samples showed a range of 0.01 to 0.54 per cent copper and 3.80 to 5.00 per cent iron. The nearby country rock showed a range 0.01 to 0.18 per cent copper and 4.70 to 5.55 per cent iron. A company report quotes an average of 160 ppm copper and 20 ppm molybdenum for nine samples of porphyry and 310 ppm

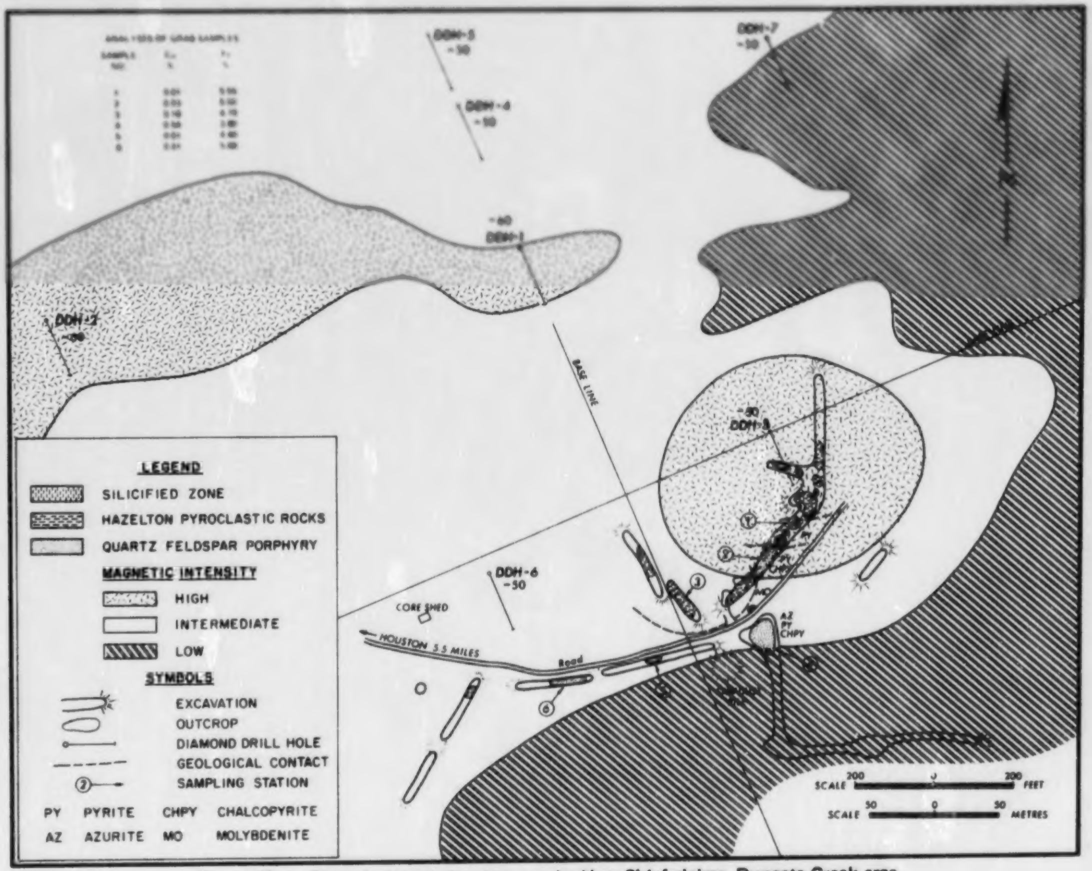

LEGEND
SILICIFIED ZONE
HAZELTON PYROCLASTIC ROCKS
QUARTZ FELDSPAR PORPHYRY
MAGNETIC INTENSITY
HIGH
INTERMEDIATE
LOW
SYMBOLS
EXCAVATION
OUTCROP
DIAMOND DRILL HOLE
GEOLOGICAL CONTACT
SAMPLING STATION
PY PYRITE
CHPY CHALCOPYRITE
AZ AZURITE
MO MOLYBDENITE
DDH-1 -60
DDH-2 -50
DDH-3 -50
DDH-4 -50
DDH-6 -50
DDH-7 -50
DDH-8 -50
BASE LINE
CORE SHED
HOUSTON 5.5 MILES
Road
AZ PY CHPY
MO
PY
SCALE 200 0 200 FEET
SCALE 50 0 50 METRES
N

Figure 45. Plan of mineral showings on the Hot, Chief claims, Dungate Creek area.

copper and 50 ppm molybdenum for four samples of country rock. Also composite samples submitted by the company for gold and silver assay returned results ranging from trace to 0.02 ounce per ton gold and 0.2 to 0.4 ounce per ton silver.

The general low values, especially for copper as determined from core and surface rock chip samples, do not appear to account for some very high soil geochemical results. A total of 720 soil samples collected by the company showed 100 samples with more than 50 ppm copper and some of these with copper in excess of 500 ppm.

REFERENCES: *Minister of Mines, B.C., Ann. Rept., 1965, p. 80; 1966, p. 103; 1968, p.* 138; Assessment Reports 909, 1157, 1181.

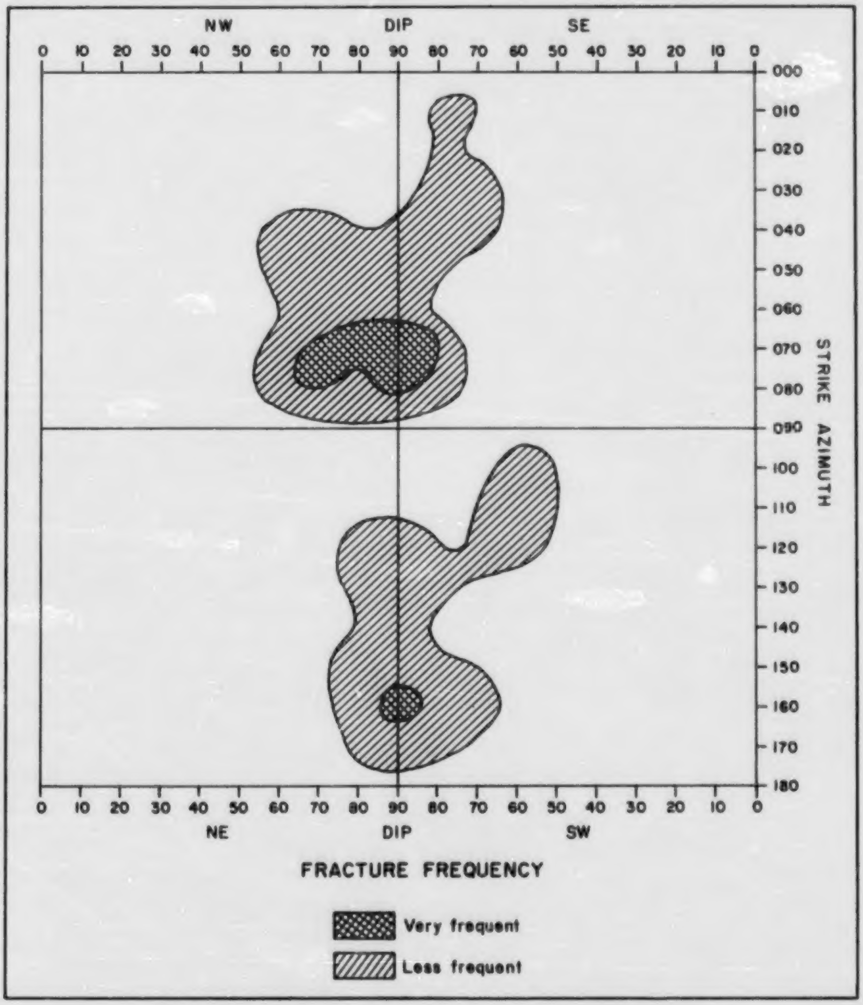


Figure 46. Frequency plot of fractures in the Dungate Creek area.

DEER (No. 32, Fig. D)

By B. N. Church

LOCATION: Lat. 54° 23.7' Long. 126° 34' (93L/7E)
OMINECA M.D. At Mud Lake approximately 3 miles east of Houston.

CLAIMS: DEER 1 to 12, 21 to 26, ARROW 1 to 30, OBLEO 1 to 40, SNYDER 1 to 8.

ACCESS: By road from Houston, approximately 3 miles.

OPERATOR: RIO TINTO CANADIAN EXPLORATION LIMITED, 615, 555 Burrard Street, Vancouver 1.

METALS: Copper, zinc, fluorite.

DESCRIPTION:

INTRODUCTION: The Deer property is located in a region of poorly exposed Hazelton volcanic rocks in the northwest part of the Buck Creek map-area (Figs. 34 and 47).

The focus of interest in this area is a small copper prospect near Mud Lake discovered by Julian Mining Co. Ltd. in 1963 and restaked by E. H. Lund in 1965. Subsequently the property has been examined by Canadian Exploration Limited in 1966, Amax Exploration, Inc. in 1968, and Rio Tinto Canadian Exploration Limited in 1971 and 1972.

The work done to date includes excavation of open cuts and pits near the main showings, bulldozer trenching at many other points on the property, a general copper and molybdenum soil geochemical survey, and magnetometer and induced polarization geophysical surveys.

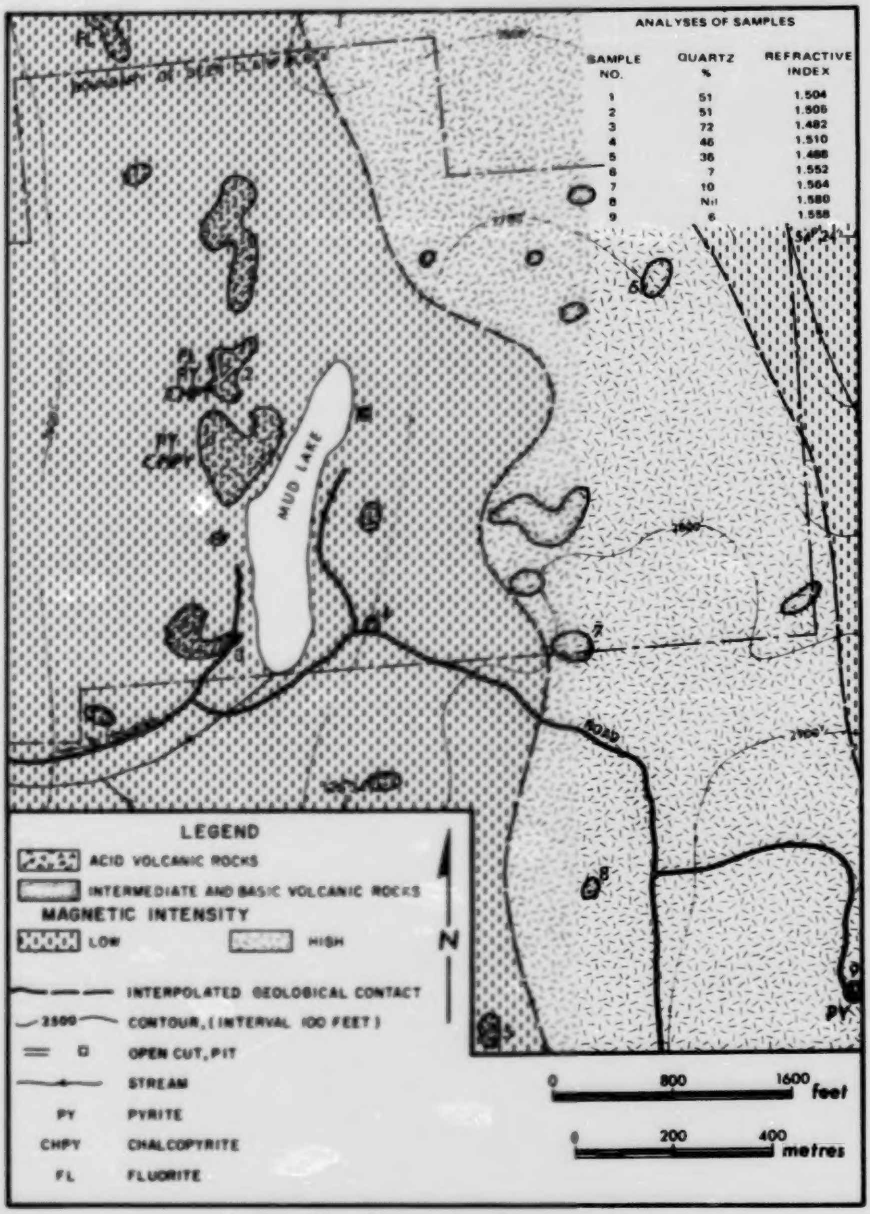
GENERAL GEOLOGY: A reconnaissance investigation of the scattered outcrops shows a prevalence of acid pyroclastic rocks in the west part of the property in the vicinity of Mud Lake and adjacent areas to the north and south; the east part of the property is underlain mainly by basic and intermediate lavas and breccia. These units which differ markedly in magnetic response can be readily traced from the Dungate Creek area several miles to the south.

Five samples collected from the acid volcanic unit are typically rhyolitic with an average refractive index of 1.498 and an average of 51 per cent quartz. Four samples of the more basic unit are mostly andesitic composition with an average refractive index of 1.563 and 6 per cent quartz.

Compilation of 53 fracture measurements from the area shows three main joint directions; a very strong attitude striking roughly parallel to the west shore line of Mud Lake, 165 degrees dipping 85 degrees southwest, and two weaker cross-joint directions striking 085 degrees dipping 65 degrees southeast and 075 degrees dipping 70 degrees northwest.

MINERALIZATION: The best mineralization is found in the trenches and pits on the ridge immediately northwest of Mud Lake. There chalcopyrite with accompanying pyrite occurs as disseminations and seams filling small fractures in brittle pink aplite-like rocks – possibly minor intrusions. A well-mineralized specimen assayed: , gold, trace; silver, trace; copper, 1.5 per cent; iron, 4.90 per cent.

Elsewhere in the same general area minor amounts of sphalerite and galena are reported to be associated with thin quartz carbonate veinlets. Fluorite is widely distributed throughout the host volcanic rocks even beyond the zone of sulphide mineralization.



FL
Boundary of Steel claim group
MUD LAKE
PY
CHPY
ROAD
2500
2700
2900
54°24'
LEGEND
ACID VOLCANIC ROCKS
INTERMEDIATE AND BASIC VOLCANIC ROCKS
MAGNETIC INTENSITY
LOW
HIGH
N
INTERPOLATED GEOLOGICAL CONTACT
CONTOUR, (INTERVAL 100 FEET)
OPEN CUT, PIT
STREAM
PY PYRITE
CHPY CHALCOPYRITE
FL FLUORITE
0 800 1600 feet
0 200 400 metres

ANALYSES OF SAMPLES

SAMPLE NO.	QUARTZ %	REFRACTIVE INDEX
1	51	1.504
2	51	1.506
3	72	1.482
4	46	1.510
5	36	1.486
6	7	1.552
7	10	1.564
8	Nil	1.580
9	6	1.558

Figure 47. Geology of the Deer property.

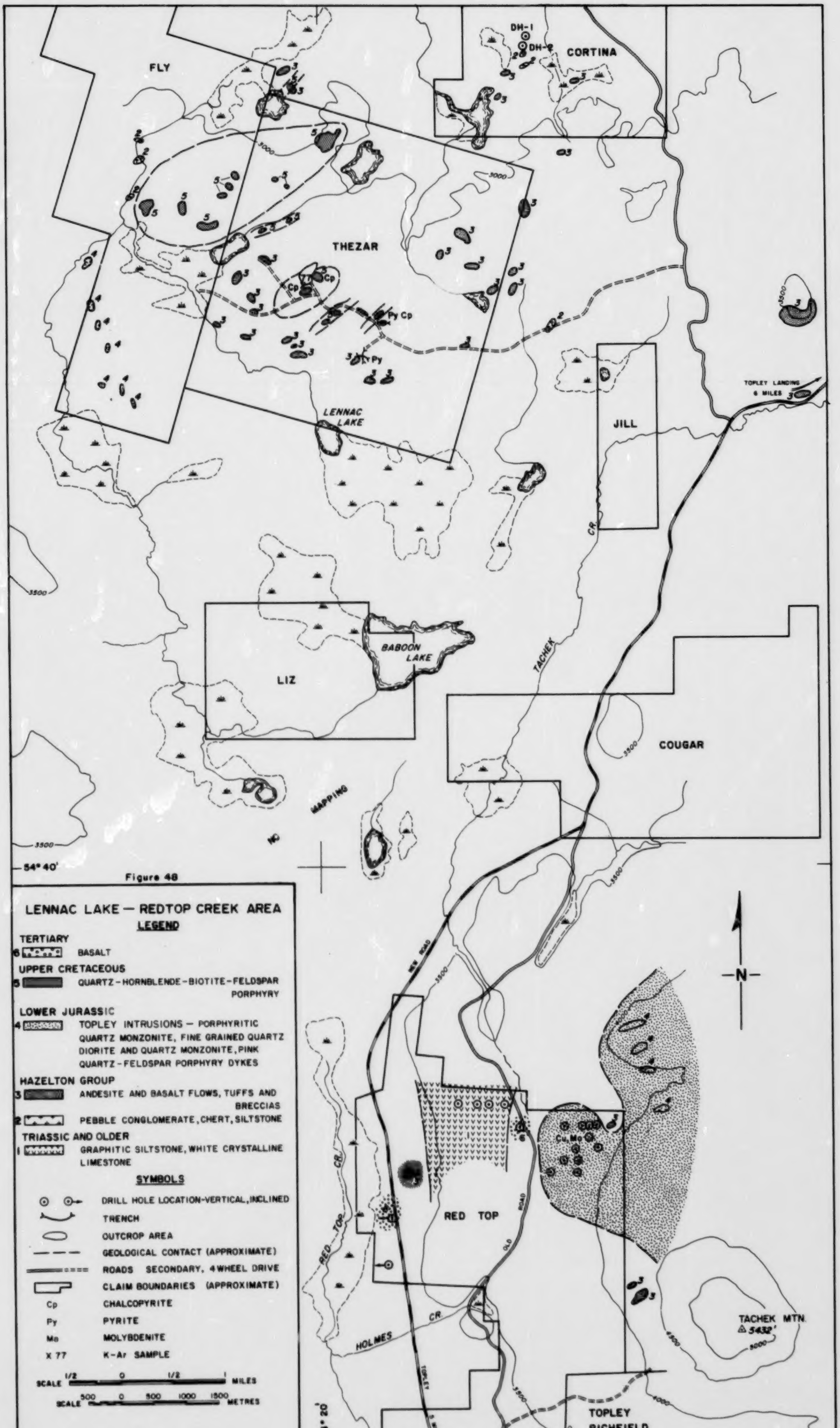

FLY
DH-1
DH-2
CORTINA
THEZAR
Cp
Py Cp
Py
LENNAC LAKE
JILL
TOPLEY LANDING 6 MILES
CR.
3500
3000
LIZ
BABOON LAKE
TACHEK
COUGAR
NO MAPPING
54° 40'
N
NEW ROAD
OLD ROAD
Cu, Mo
RED TOP
RED TOP CR.
HOLMES CR.
TOPLEY 5 MILES
126° 20'
TACHEK MTN. △ 5432'
4500
5000
4000
TOPLEY RICHFIELD

Figure 48

LENNAC LAKE — REDTOP CREEK AREA

LEGEND

TERTIARY

6 BASALT

UPPER CRETACEOUS

5 QUARTZ-HORNBLENDE-BIOTITE-FELDSPAR PORPHYRY

LOWER JURASSIC

4 TOPLEY INTRUSIONS — PORPHYRITIC QUARTZ MONZONITE, FINE GRAINED QUARTZ DIORITE AND QUARTZ MONZONITE, PINK QUARTZ-FELDSPAR PORPHYRY DYKES

HAZELTON GROUP

3 ANDESITE AND BASALT FLOWS, TUFFS AND BRECCIAS

2 PEBBLE CONGLOMERATE, CHERT, SILTSTONE

TRIASSIC AND OLDER

1 GRAPHITIC SILTSTONE, WHITE CRYSTALLINE LIMESTONE

SYMBOLS

⊙ ⊙→	DRILL HOLE LOCATION-VERTICAL, INCLINED
	TRENCH
	OUTCROP AREA
	GEOLOGICAL CONTACT (APPROXIMATE)
	ROADS SECONDARY, 4 WHEEL DRIVE
	CLAIM BOUNDARIES (APPROXIMATE)
Cp	CHALCOPYRITE
Py	PYRITE
Mo	MOLYBDENITE
X 77	K-Ar SAMPLE

SCALE 1/2 0 1/2 1 MILES

SCALE 500 0 500 1000 1500 METRES

Geology based in part on company plans

According to a company report analysis of 401 representative soil samples from the property showed 49 samples with more than 50 p m copper and only 4 samples with more than 100 ppm copper. A combination of impervious clay-rich glacial deposits and high soil acidity, typical of the area, may have hampered geochemical evaluations.

WORK DONE: Induced polarization survey, 8.9 line-miles and magnetometer survey, 12.5 line-miles covering Deer 1-12, 21-26, Snyder 7 and 8, Arrow 10, 23-30, and Obleo 1-23 and 25; trenching, 1,085 feet on Deer 1, 2, and 3 and Obleo 3, 11, and 13.

REFERENCES: Assessment Reports 1608, 3767.

LENNAC LAKE – REDTOP CREEK AREA

By N. C. Carter

The area shown on Figure 48 includes several claim groups on which considerable exploration work was performed in 1972.

Access within the area is good. The improved secondary road between Topley on Highway 16 and Topley Landing and Granisle on Babine Lake traverses the area in a northerly direction and numerous branch roads lead from it to most of the claim groups. Not shown on Figure 48 is the private Bulkley Valley Forest Industries road which links Topley Landing and Houston, and which crosses the central part of the map-area.

Records of earliest exploration work within the area date back to the 1920's when the gold-silver-lead-zinc veins on the Topley Richfield property underwent considerable underground development. In 1969, a number of claims, including the Red Top property (Cleo, Lana, and Summit claims) of Summit Oils Limited and Evergreen Explorations Ltd., were located following the release of government airborne magnetic maps. The Cougar, Cortina, and Thezar claims were located in 1971 and the Fly and Evergreen claim groups were staked in 1972.

The area lies within the Nechako Plateau and is one of gentle relief, with elevations over much of the area ranging between 3,000 and 3,500 feet. Near the southeastern part of the area on Figure 48 elevations rise relatively abruptly at the base of Tachek Mountain. Glacial deposits of sand and gravel cover most of the area and swamps and small lakes are numerous. Bedrock exposures are mainly confined to low hills and ridges.

The oldest rocks in the area, graphitic siltstones and white, banded limestone, were encountered during drilling on the Red Top property and because of their similarity to rocks exposed near Fulton Lake to the north, they are regarded as being Triassic or older. Hazelton Group rocks, of probable Lower Jurassic age, include a variety of andesite and basalt flows and fragmental rocks which are interbedded with siltstones and pebble conglomerates. Some Tertiary basalts are also known from drilling on the Red Top property (Fig. 48).

Intrusive into the Jurassic and older rocks are granitic rocks of the Topley Intrusions, regarded as being of Lower Jurassic age, based on a K-Ar date of 176±7 million years obtained from similar rocks south of Topley Landing. Near the north part of the map-area are two small stocks of quartz-hornblende-biotite-feldspar porphyry of Upper Cretaceous age, which intrude Hazelton Group volcanic rocks.

Copper occurrences are known throughout the area. Pyrite and chalcopyrite are reported to occur in granitic and volcanic rocks on the Cougar claims and in pebble conglomerates and volcanic breccias on the Cortina property. Copper and molybdenum occur in fractures in a fine-grained phase of the Topley Intrusions. Chalcopyrite also occurs in fractures in the small porphyry stock on the Thezar claims to the north.

REFERENCES: Land, A. H. (1940), Houston Map-area, British Columbia, *Geol. Surv., Canada,* Paper 40-18.

RED TOP, BEAVER DAM (No. 131, Fig. D)

By N. C. Carter

LOCATION: Lat. 54° 37' Long. 126° 16' (93L/9W)
OMINECA M.D. At approximately 3,600 feet elevation 9 miles north of Topley on the Topley-Granisle road.

CLAIMS: CRIS, MIKE, PETE, LANA, CLEO, SUMMIT, totalling 206.

ACCESS: By road from Topley, 9 miles.

OWNER: DUCANEX RESOURCES LIMITED, 1202, 1177 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum, silver, gold.

DESCRIPTION:

The claims were located in 1969 by Summit Oils Limited and Evergreen Explorations Ltd. to cover magnetic anomalies indicated on newly released Federal-Provincial airborne magnetic maps. Subsequent work by both companies delineated interesting induced polarization anomalies coincident with, and adjacent to, large magnetic anomalies. Drilling by Summit Oils Limited showed the magnetic anomaly adjacent to Redtop Creek to be due to the presence of Tertiary basalt. In 1972, drilling by Ducanex Resources Limited, indicated a large linear induced polarization anomaly adjacent to the Topley Landing road to be caused by a graphitic siltstone horizon within Triassic or older rocks (Fig. 48).

Further drilling to the east of the Topley Landing road resulted in the discovery of Topley granitic rocks containing pyrite, chalcopyrite, and molybdenite. Where relatively unaltered, these rocks are fine-grained massive granodiorites, light grey in colour and consisting of quartz, plagioclase with incipient sericite alteration, fresh K-feldspar, hornblende nearly totally altered to green biotite, and primary biotite altered to chlorite. Better grades of mineralization apparently occur in intensely altered varieties of granodiorite which are buff in colour and consist essentially of quartz, sericite, and carbonate. Chalcopyrite, molybdenite, and pyrite occur most commonly as selvages or disseminations in one-eighth to one-quarter-inch quartz veinlets commonly rimmed by secondary K-feldspar.

WORK DONE: Surface geological mapping, 1 inch equals 600 feet covering all claims; induced polarization survey, approximately 20 line-miles covering most of the claims; surface diamond drilling, 17 holes totalling approximately 6,000 feet covering mostly the Cris claims.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1926, pp. 138-144; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 119; 1970, p. 157; Assessment Reports 2293, 2562, 2930, 2958.

THEZAR (No. 42, Fig. D)

By N. C. Carter

LOCATION: Lat. 54° 44.7′ Long. 126° 20.0′ (93L/9W, 16W)
OMINECA M.D. Nine miles southwest of Topley Landing between elevations of 3,100 and 3,400 feet.
CLAIMS: THEZAR 1 to 132.
ACCESS: By four-wheel-drive vehicle from the Topley Landing road, 5 miles.
OWNER: AMAX POTASH LIMITED, 601, 535 Thurlow Street, Vancouver 5.
METAL: Copper.
DESCRIPTION:

The property was located in 1971 following a regional geochemical survey of an area between Highway 16 and Babine Lake, and the discovery of an outcrop of porphyry containing copper mineralization north of Lennac Lake.

The oldest rocks on the property are volcanic rocks of the Hazelton Group, including maroon and green andesite tuffs and breccias and porphyritic basalts which contain 0.5 to 1.0-millimetre plagioclase laths. Outcrops of sedimentary rocks were noted just east of the claim group.

A small oval stock-like body of quartz-hornblende-biotite-feldspar porphyry, elongate in a northeast direction and measuring 4,000 by 2,000 feet, is centred around a small lake near the central part of the property (Fig. 48). The porphyry is of granodiorite composition and phenocrysts constitute 30 per cent of the rock. Trenches south of the small lake expose relatively unaltered porphyry and a typical specimen from this area consists of quartz, 15 per cent, usually occurring as 2 to 4-millimetre anhedral phenocrysts, plagioclase ($An_{30/35}$), 45 per cent, occurring both in the matrix and as 4 to 7-millimetre euhedral phenocrysts, K-feldspar, 15 per cent, restricted to the matrix and marginal to fractures, biotite, 10 per cent, in the form of 5-millimetre books, and hornblende, 5 per cent, usually exhibiting incipient alteration to fine-grained brown biotite.

A sample collected from a trench south of the small lake and analysed at the University of British Columbia geochronology laboratory yielded a K-Ar age of 77±2 million years.

Potassic alteration is weak to moderate within the main trench area and consists of secondary K-feldspar adjacent to fractures and secondary biotite alteration of hornblende. To the east of the stock are two northeast-striking porphyry dykes and there the intrusive rocks exhibit features typical of a quartz-sericite-pyrite alteration zone. Plagioclase is almost totally altered to sericite-carbonate, hornblende is altered to a mixture of chlorite and epidote, and biotite is completely chloritized. Pyrite is disseminated throughout the rock as well as being intimately associated with altered mafic minerals.

Hazelton Group volcanic rocks have been metamorphosed to biotite hornfels marginal to the porphyry stock and dykes. Inclusions of hornfelsed Hazelton volcanic rocks are numerous within the stock and these rocks also contain significant amounts of magnetite.

Sulphide mineralization is centred about the porphyry stock and occurs over an area of 1.5 by 1 mile. The major copper showings are within the porphyry stock where chalcopyrite, pyrite, magnetite, and minor chalcocite and molybdenite occur in northwest-striking one-sixteenth to one-eighth-inch veinlets with quartz and some

K-feldspar. Chalcopyrite mineralization was also noted as films on dry fractures in inclusions of volcanic rocks within the stock and in hornfelsed rocks in a trenched area 1 mile to the east (Fig. 48).

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; induced polarization survey, 23 line-miles and magnetometer survey, 20.5 line-miles covering the central part of the claim group; geochemical soil survey, 470 samples covering the central part of the claim group; trenching, 700 feet on Thezar 64.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 175; Assessment Reports 3807, 3808.

FLY (No. 180, Fig. D)

By N. C. Carter

LOCATION: Lat. 54° 45′ Long. 126° 22′ (93L/9W, 16W)
OMINECA M.D. At approximately 3,000 feet elevation between Fulton and Baboon Lakes, 10 miles southwest of Topley Landing.

CLAIMS: FLY, totalling 98.

ACCESS: By secondary and four-wheel-drive vehicle road from Topley Landing, 12 miles.

OWNER: CITIES SERVICE MINERALS CORPORATION, 405, 1200 West Pender Street, Vancouver 1.

DESCRIPTION:

The property was located in mid-1972 following an interpretation of airborne magnetic maps.

Much of the area covered by the claims is flat, except for a 250-foot-high hill in the central part of the claim group. The hill is underlain by an elliptical stock-like body of quartz-hornblende-biotite-feldspar porphyry, elongate in a northeasterly direction and measuring 5,000 by 10,000 feet (Fig. 48). The porphyry, Upper Cretaceous in age and of granodiorite composition, is a medium-grained rock in which phenocrysts constitute 30 per cent of the rock by volume and include 4 to 7-millimetre euhedral grains of plagioclase (An_{35}), 4-millimetre resorbed quartz eyes, and 2 to 4-millimetre biotite books and hornblende crystals. The phenocrysts are set in a very fine-grained matrix of K-feldspar and quartz.

The stock intrudes andesite and basalt tuffs and breccias and argillaceous sedimentary rocks of the Hazelton Group. Small northeast dykes are situated north and south of the stock. A low northwest-trending ridge south of the stock is underlain by porphyritic granodiorite of the Topley intrusions.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Fly 1 to 96; electromagnetic survey, 15 line-miles, magnetometer survey, 20 line-miles, and induced polarization survey, 48 line-miles covering part of the Fly claim group; geochemical soil survey, 1,300 samples covering part of the Fly claim group; road construction, 1 mile (extending the bush road to the claims).

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, Map 69-1; Assessment Report 4192.

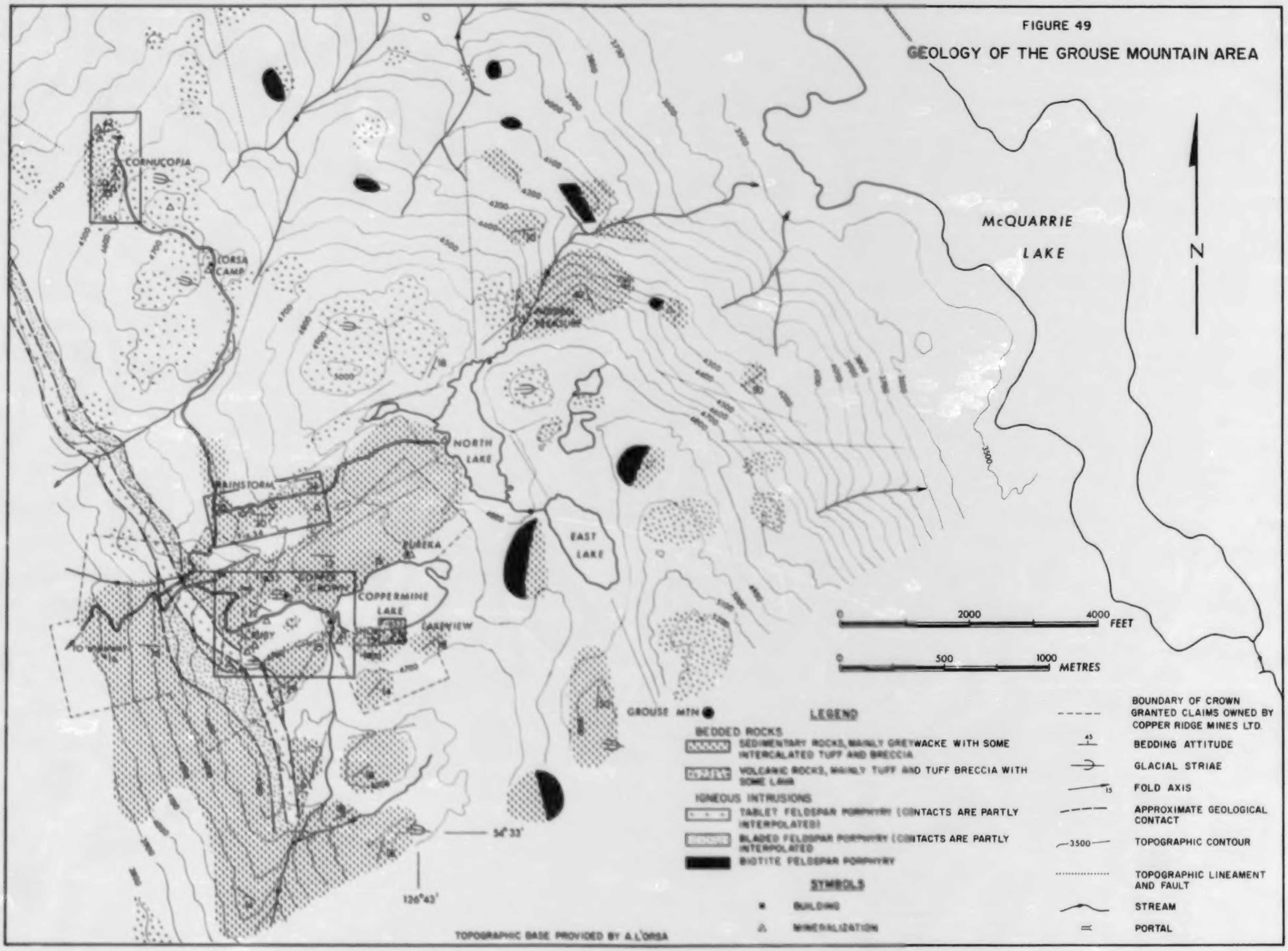


FIGURE 49

GEOLOGY OF THE GROUSE MOUNTAIN AREA

McQUARRIE LAKE
N
CORNUCOPIA
L'ORSA CAMP
NORTH LAKE
RAINSTORM
EUREKA
EAST LAKE
SONO GROUP
COPPERMINE LAKE
LAKEVIEW
TO HIGHWAY 16
GROUSE MTN
54°33'
126°43'
3500
4100
4200
4300
4400
4500
4600
4700
4800
4900
5000
0
2000
4000
FEET
0
500
1000
METRES
LEGEND
BEDDED ROCKS
SEDIMENTARY ROCKS, MAINLY GREYWACKE WITH SOME INTERCALATED TUFF AND BRECCIA
VOLCANIC ROCKS, MAINLY TUFF AND TUFF BRECCIA WITH SOME LAVA
IGNEOUS INTRUSIONS
TABLET FELDSPAR PORPHYRY (CONTACTS ARE PARTLY INTERPOLATED)
BLADED FELDSPAR PORPHYRY (CONTACTS ARE PARTLY INTERPOLATED
BIOTITE FELDSPAR PORPHYRY
SYMBOLS
BUILDING
MINERALIZATION
BOUNDARY OF CROWN GRANTED CLAIMS OWNED BY COPPER RIDGE MINES LTD.
45
BEDDING ATTITUDE
GLACIAL STRIAE
15
FOLD AXIS
APPROXIMATE GEOLOGICAL CONTACT
3500
TOPOGRAPHIC CONTOUR
TOPOGRAPHIC LINEAMENT AND FAULT
STREAM
PORTAL
TOPOGRAPHIC BASE PROVIDED BY A. L'ORSA

GEOLOGY OF THE GROUSE MOUNTAIN AREA OMINECA MINING DIVISION

By B. N. Church

INTRODUCTION: Current prospecting interest in bedded volcanogenic sulphide deposits prompted the investigation of reports of the presence of stratiform mineralization in the Jurassic volcanic assemblage on Grouse Mountain north of Houston. This study is based largely on 18 days of fieldwork performed by the writer during July 1971 and a brief visit to the area again in 1972.

Grouse Mountain is at the south end of the Babine Range 12 miles due north of Houston and is accessible by a 3-mile-long steep dirt road leading from the Hungry Hill section of Highway 16 between Smithers and Houston.

The map-area, covering about 6 square miles, extends westward from the gentle slopes near McQuarrie Lake, elevation 3,448 feet, past the cusp summit of Grouse Mountain, elevation 5,312 feet, to the western edge of the plateau area which forms much of the upper surface of the mountain. Coppermine Lake and a number of other small lakes and ponds occupy shallow depressions just below tree line on the plateau in the vicinity of the main mineral prospects (Fig. 49).

Much of the topographic sculpturing evident on this mountain giving rise to its general molar-like form is due to the last Pleistocene ice sheet which, according to numerous glacial striae measurements, moved easterly at approximately 095 degrees across the summit.

PROSPECTING HISTORY: The early history of this area is recorded in the Annual Reports of the Minister of Mines for the years 1914 to 1929 and by J. D. MacKenzie (1915) of the Geological Survey of Canada. More recent activity is reported by J. M. Black, Minister of Mines Annual Report for 1951 and N. C. Carter, Geology, Exploration, and Mining in British Columbia, 1970.

In 1914 Samuel Bush, Louis Schorn, and partners discovered what are now known as the Copper Crown, Ruby, Lakeview, Schorn, and Eureka copper and zinc sulphide showings near Coppermine Lake. In 1916 the Cassiar Crown Copper Company, which was formed to consolidate the various holdings, sank a shaft 56 feet deep on the Copper Crown about 500 feet southwest of Coppermine Lake. Soon after, work commenced on an adit crosscut at the 4,450-foot level 850 feet to the west. The plan was to intersect an ore shoot some 250 feet below the shaft. The ore was to be transported 4.5 miles from portal to Walcott station on the Canadian National Railway's main line servicing the Bulkley Valley. However, by November, 1917, the crosscut had advanced about 1,000 feet without encountering appreciable mineralization and further work was stopped.

After reorganization of the Company, attention was focussed on the Ruby showing. Activity continued in this area until 1923 by which time a lens of mixed sulphides was traced several hundred feet from a short adit crosscut on the 4,540-foot level. This underground exploration proved unsuccessful in locating anything commensurate with the surface showings and little was done for several years. In 1926 there was a marked revival of interest. A camp was constructed and extensive exploratory work began again. A total of 3,700 feet of drifts and crosscuts, 160 feet of raises and a shaft linked the Ruby workings with those of the Copper Crown. Work was suspended in the summer of 1926 when the total ore outlined still proved insufficient.

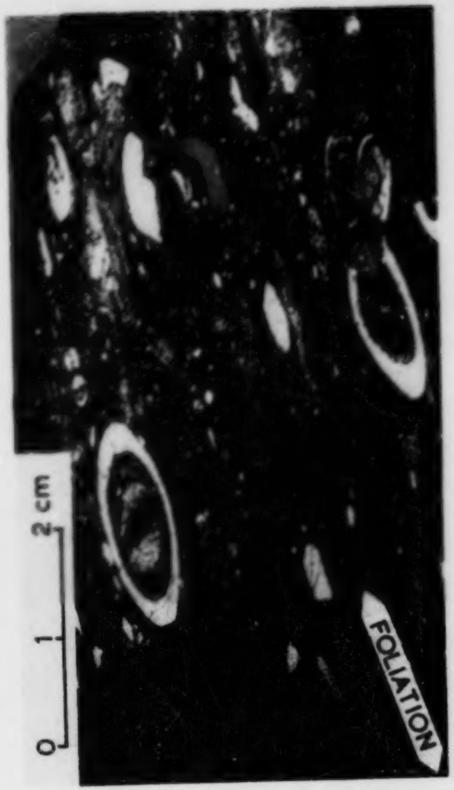

2 cm
1
0
FOLIATION

Plate XA. Accretionary lapilli elongated parallel to foliation, Hazelton Group rocks on Grouse Mountain.

Plate XB. Bladed feldspar porphyry dyke, Goosly type, Grouse Mountain.

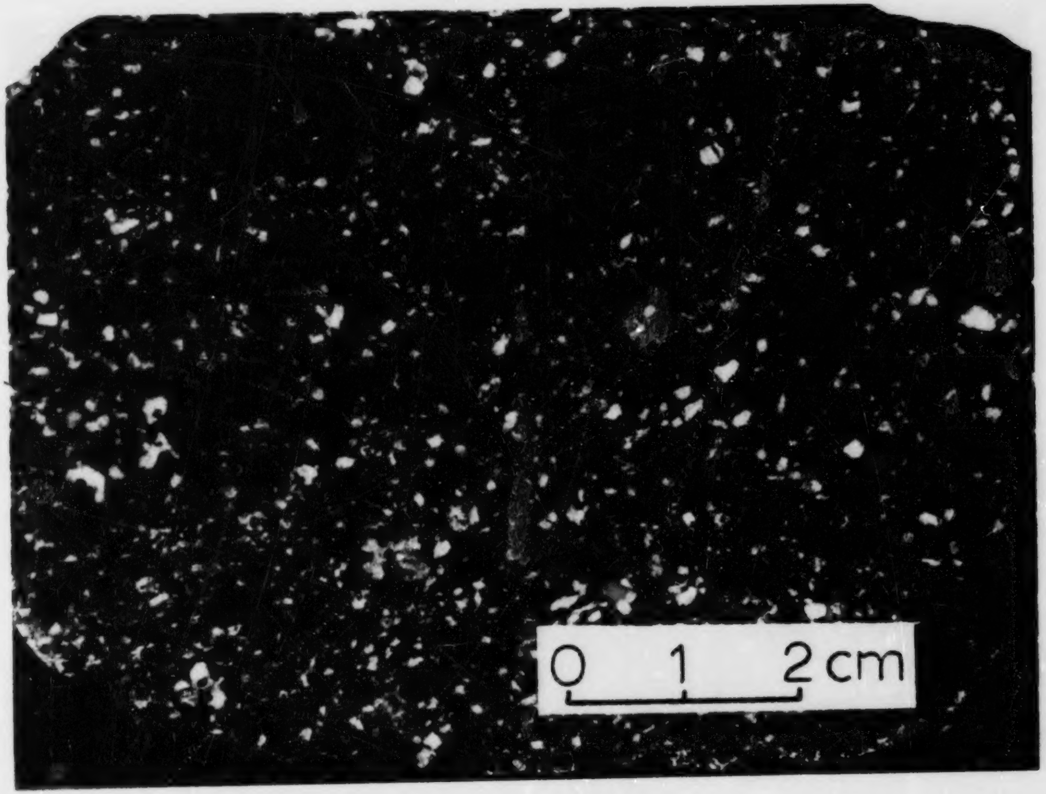


Plate XI. Crystal lithic tuff and breccia, Rainstorm zone, Grouse Mountain.

The Lakeview showing was re-examined during the period 1924 to 1925. The most significant work at that time was an adit driven about 80 feet along a narrow vein; this is approximately 25 feet above and somewhat west of a short older adit on the south shore of Coppermine Lake.

Elsewhere, activity from 1924 to 1929 lead to the discovery of the Rainstorm, Hidden Treasure, and Cornucopia (Last Chance) showings (*see* Fig. 49 for locations). A number of short adits in the Hidden Treasure and Cornucopia areas date from this period.

The next pulse of activity was in 1951 when Transcontinental Resources Ltd. and Copper Ridge Mines Ltd., acquired the Cassiar Crown group and adjacent claims. During that period the old workings were dewatered and retimbered prior to resampling. In August 1952, after almost 5,000 feet of diamond drilling, work was suspended, the programme again failing to delineate sufficient ore.

Finally the most recent exploration was performed in the period 1964 to 1970 by Messrs. A. L'Orsa, M. Chapman, and C. Delage on the ground mostly north of the Copper Ridge claims. This work included bulldozer trenching in the vicinity of the old Rainstorm and Cornucopia showings and a significant extension of the road system to connect the prospects to North Lake and the main Coppermine Lake access road.

GENERAL GEOLOGY: The rocks underlying the map-area belong mainly to the Hazelton Group. They consist of an assemblage of gently dipping resistant lavas and pyroclastic rocks exposed on the summit and north slope of Grouse Mountain plus scattered weaker sedimentary units found mainly near Coppermine Lake on the plateau area and locally west of McQuarrie Lake on the northeast slope. These beds are cut by a system of subparallel dykes representing a variety of compositions and possible ages (Fig. 49).

Bedded Rocks: The Hazelton Group defined in the Driftwood Creek area, about 15 miles northwest of Grouse Mountain, has three stratigraphic divisions. According to Hanson (1924)* these divisions comprise a lower assemblage of volcanic rocks, mostly andesitic lavas and tuff, a middle fossiliferous sedimentary division of argillite, quartzite, and tuff (Middle Jurassic) and upper volcanic rocks similar to the lower assemblage except, notably, with some rhyolite. Elsewhere beyond the type area the upper volcanic rocks rest almost without distinction on the lower unit. Also, isolated wedges of sedimentary rock cannot be readily correlated with the middle division of the type section.

The Hazelton volcanic rocks are undivided in the map-area. They consist primarily of massive maroon and grey breccia and tuff deposits interspersed with a few greenish lava flows. A composition breakdown of the rocks based on arc fusion analysis shows 38 per cent basalt, 44 per cent andesite, 15 per cent dacite, and 3 per cent rhyolite (Fig. 50).

Pyroclastic material is most abundant. Lithic fragments predominate, however, petrographic studies show a high proportion of shardy dust in some rocks and numerous broken feldspar crystals in others (Plate XI). The presence of well-preserved accretionary lapilli is taken as evidence that at least part of the accumulation is the result of subareal volcanic eruption (Plate XA).

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*H. W. Tipper of the Geological Survey of Canada and E. W. Grove of the British Columbia Department of Mines and Petroleum Resources are currently preparing an extensive revision of the Hazelton Group.

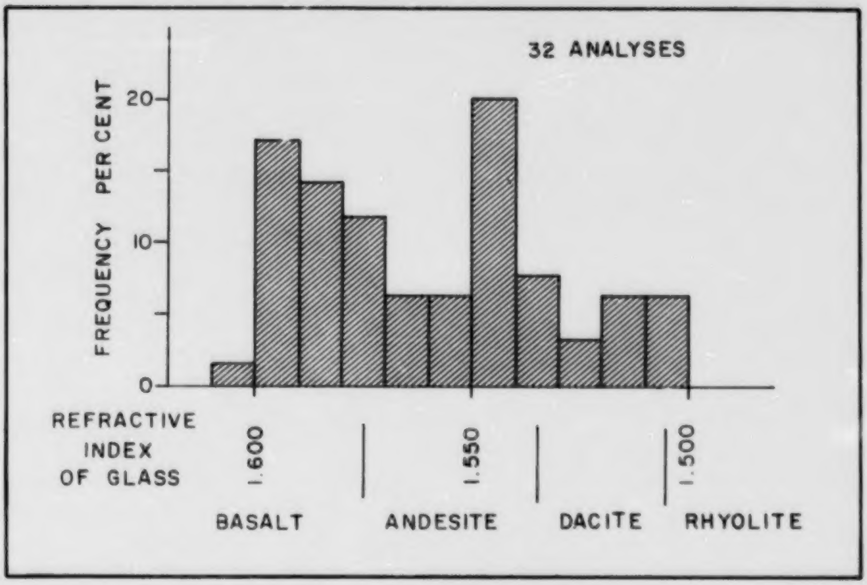


Figure 50. Frequency plot of refractive index determinations on fused Hazelton volcanic rocks, Grouse Mountain area.

The rocks are never entirely free from the effects of cataclasis or alteration of some type. The most competent units are normally well jointed or cleaved and often display tectonic breccias of varying development in the vicinity of faults. The less completent facies are commonly foliated; in many cases distortion of primary structures and superposition of preferred fabrics appear to be due to gliding translation on incipient subparallel fractures (Plate XA). In thin section these glide planes are often marked by the growth of very small plates of secondary mica.

The products of partial or complete degeneration of the primary mineral component of these rocks (mainly feldspar, ferromagnesian minerals, and glass) are mica and clay minerals, chlorite, and fine iron oxide dust, carbonates, and less commonly epidote.

The sedimentary rocks comprise an assortment of grey and light brown volcanic wackes and siltstones with some intercalated tuff and breccia lenses. Conglomerates are less common as are shales and argillites; quartzites, cherts, and limy beds are scarce. This assemblage differs from the middle division of the type Hazelton section which shows a preponderance of quartzites and dark argillites.

The main panel of sedimentary rocks, near Coppermine Lake, dips gently to the south and appears to pass laterally into massive volcanic formations from which the clastics were probably originally eroded. An examination of thin sections prepared from samples of several sandstone facies shows an abundance of volcanic rock fragments mixed with worn feldspars (often with wormy inclusions) plus a few quartz and chert grains in a clay matrix.

Fossils, thought to be Jurassic age, secured from these rocks include belemnite and *Trigonia* forms and pelecypods tentatively identified as *Gervillia sp.* and *Gryphaea sp.*

TABLE OF CHEMICAL ANALYSES

	A	1	B	2	C	3
			Oxides Recalculated to 100			
SiO_2	50.38	53.22	54.27	55.52	59.89	60.69
TiO_2	2.20	1.62	1.69	1.59	1.52	1.14
Al_2O_3	16.33	15.64	17.41	17.05	17.62	18.39
Fe_2O_3	4.38	3.25	4.71	2.35	3.74	2.62
FeO	5.37	6.73	3.08	4.00	2.14	2.51
MnO	0.17	0.13	0.12	0.09	0.11	0.06
MgO	5.65	5.07	3.91	3.53	2.09	1.99
CaO	10.05	9.13	7.01	8.01	5.63	4.62
Na_2O	4.21	3.55	4.66	4.93	4.01	4.61
K_2O	1.46	1.66	3.11	2.93	3.20	3.37
	100.00	100.00	100.00	100.00	100.00	100.00
			Oxides as Determined			
H_2O+		2.34		0.83		1.28
H_2O-		0.45		0.25		0.23
CO_2		3.33		0.25		nil
SO_3		1.08		0.43		0.30
P_2O_5		0.67		1.00		0.60
SrO		0.13		0.18		0.20
BaO		0.09		0.06		0.08
			Molecular Norms			
Quartz		0.9		-----		7.9
Orthoclase		9.8		17.1		19.8
Albite		32.2		43.7		41.2
Anorthite		22.0		15.7		19.5
Wollastonite		9.4		9.5		1.3
Enstatite		14.1		1.4		5.5
Ferrosilite		6.0		0.3		0.5
Forsterite		-----		6.2		-----
Fayalite		-----		1.5		-----
Ilmenite		2.2		2.2		1.6
Magnetite		3.4		2.4		2.7

A – Gabbroic stock 3 miles southwest of Goosly Lake, average of analyses Nos. 1 and 2, p. 124, G.E.M., 1970.
1 – Basic dyke, from the area immediately southwest of Coppermine Lake.*
B – Syenomonzonite, Parrott Lakes and Goosly Lake stocks, average of analyses Nos. 3 and 4, p. 124, G.E.M., 1970.
2 – Bladed feldspar porphyry dyke, on the main road to the portals, west slope of Grouse Mountain.*
C – Goosly Lake lava, average of analyses Nos. 6 and 7, p. 124, G.E.M., 1970.
3 – Tablet feldspar porphyry dyke, adjacent west pit in the Ruby zone.*

*Analyses by S. Metcalfe, British Columbia Department of Mines and Petroleum Resources.

Intrusive Igneous Rocks: Igneous intrusions have invaded the Babine Range to an extraordinary extent compared to other ranges of the Skeena Mountains. These intrusions are predominantly Upper Cretaceous or Early Tertiary age and vary in size from stocks several miles in diameter to small dykes.

The intrusions on Grouse Mountain are essentially dyke-like bodies which strike north or northwest and dip westerly. Four possibly related varieties have been identified and mapped. These include two types of feldspar porphyry, a feldspar biotite porphyry and aphanitic basic dykes.

A large dyke found on the west side of the mountain is the most conspicuous. This is a bladed feldspar porphyry with exceptionally large plagioclase phenocrysts – some measuring as much as 4 centimetres long and one-half centimetre thick (Plate XB). These huge crystals (andesine, An_{45}) are generally aligned subparallel to the walls of the dyke and embedded in a fine-grained matrix. Thin sections show that the matrix consists of 25 per cent alkali feldspar, 55 per cent plagioclase, 15 per cent clinopyroxene and chlorite, and 5 per cent magnetite and pyrite plus numerous tiny apatite rods. A chemical analysis of this rock compares favourably with the Eocene syenomonzonite intrusions of the Goosly area southeast of Houston (*see* analyses Nos. 2 and B of the accompanying table).

A second large dyke parallels and locally cuts across the bladed feldspar porphyry. This younger intrusion is typically charged with randomly oriented tablet-shaped plagioclase phenocrysts averaging between 3 and 8 millimetres in diameter. These large crystals are zoned ($An_{40/50}$) and set in a matrix composed largely of small plates of alkali feldspar, some plagioclase and accessory pyroxene, chloritized biotite, quartz, magnetite, and a few grains of apatite and sphene. The rock is undoubtedly genetically related to the bladed feldspar porphyry and chemically similar to the Goosly Lake lavas (*see* analyses Nos. 3 and C).

A number of large dykes partially exposed in the central and northeast parts of the map-area are possibly kindred to the bladed and tablet feldspar porphyries. These are fresh rocks composed largely of varying mixtures of fine-grained alkali feldspar, plagioclase and biotite hosting very large poikilitic biotite plates, as much as 1 centimetre in diameter, and scattered smaller plagioclase phenocrysts. No chemical analyses are available.

In addition to these intrusions, the area is traversed by numerous narrow aphanitic basic dykes. These are light grey in colour, granular in texture, and seldom more than 15 feet wide. In thin section they consist of about 75 per cent randomly arranged plagioclase laths (sodic andesine) ¼ to 1½ millimetres long with interstitial pyroxene, biotite, and magnetite in about equal proportions and some accessory quartz and apatite. Chemically these rocks are only slightly more siliceous than the gabbroic intrusions of the Goosly area (*see* analyses Nos. 1 and A).

STRUCTURAL GEOLOGY: The Hazelton beds form a series of shallow plunging anticlines and synclines in the Driftwood area. According to Hanson (1924, p. 28A):

> "The sedimentary rocks as a whole have been severely folded and sheared as compared with the overlying volcanic division. During folding the assemblages of volcanic rock acted in the main as hard, unyielding masses, and the compression was taken up by the intervening sediments."

Shear zones cut across the folds striking east and southeast.

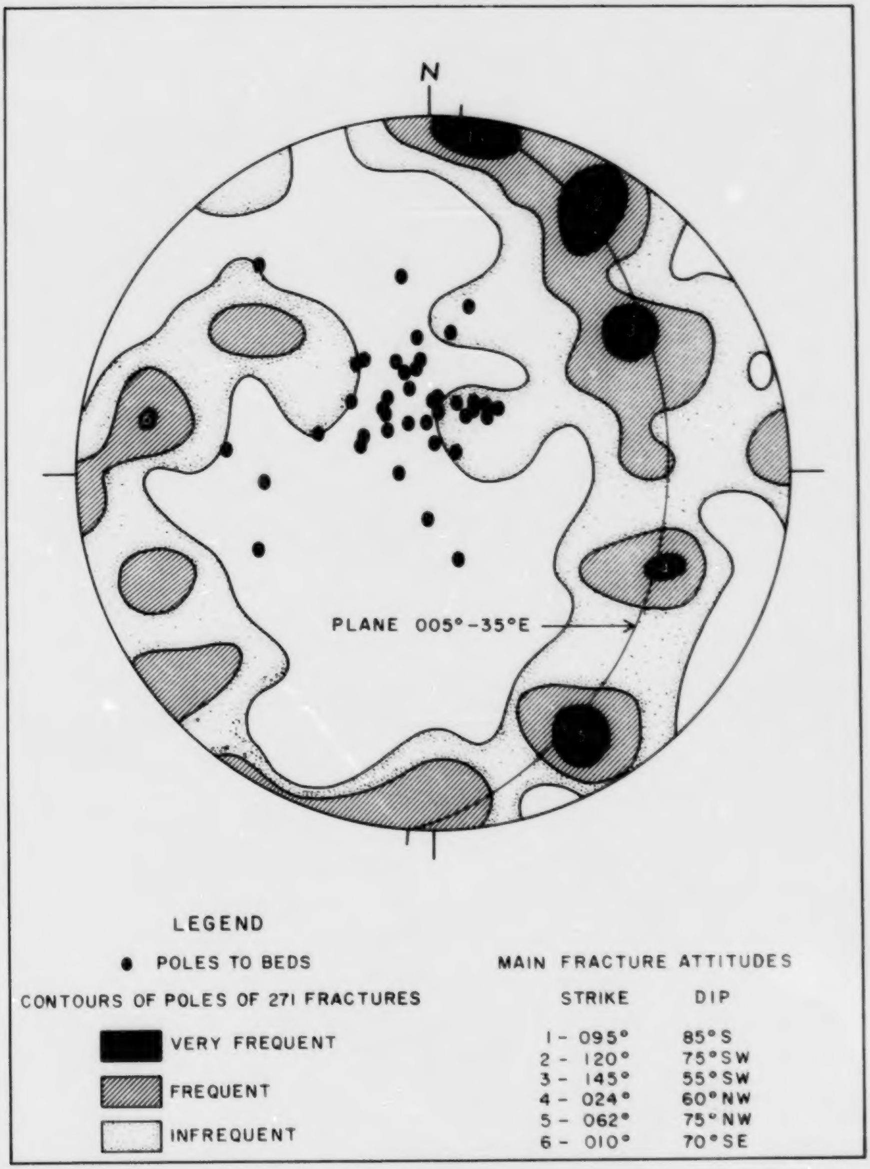
In the Grouse Mountain area the overall structure is comparatively simple. However bedding attitudes in the volcanic sections are few precluding the possiblity of much detailed structural analysis.

The sedimentary rocks generally dip gently in southerly directions except on the northwest slope where shales and argillites, exposed below a thick sequence of massive volcanic rocks, dip northwesterly. The only clear evidence of folding was discovered near the Hidden Treasure showing. Here thin beds near the base of the volcanic rocks are thrown into a number of small open folds with axes plunging about 15 degrees northeasterly at 050 degrees.

Fractures of varying development and consistency are amply displayed throughout the map-area. The mean attitudes are as follows:

	Development	Mean Attitudes
(1)	very strong	strike 095 degrees, dip 85 degrees south
(2)	very strong	strike 120 degrees, dip 75 degrees southwest
(3)	very strong	strike 145 degrees, dip 55 degrees southwest
(4)	very strong	strike 024 degrees, dip 60 degrees northwest
(5)	very strong	strike 062 degrees, dip 75 degrees northwest
(6)	strong	strike 010 degrees, dip 70 degrees southeast

A plot of the available data on an equal area diagram shows that many poles to fractures, including the very strongly developed joint and cleavage sets (Nos. 1 to 5 above), are dispersed near the plane of a great circle (Fig. 51). In this scheme, fractures display a wide range of possible strikes but seem to follow the rule that easterly striking fractures commonly dip most steeply, approaching vertical inclinations, and northerly striking fractures have minimum inclinations dipping westerly mostly in the range 40 to 60 degrees. A set of steep southeasterly dipping fractures (No. 6) is the main exception to the rule.


N
PLANE 005°-35°E
LEGEND
● POLES TO BEDS
CONTOURS OF POLES OF 271 FRACTURES
VERY FREQUENT
FREQUENT
INFREQUENT
MAIN FRACTURE ATTITUDES

	STRIKE	DIP
1 -	095°	85° S
2 -	120°	75° SW
3 -	145°	55° SW
4 -	024°	60° NW
5 -	062°	75° NW
6 -	010°	70° SE

Figure 51. Equal area diagram showing the bedding attitudes and the fracture frequencies in the Grouse Mountain area.

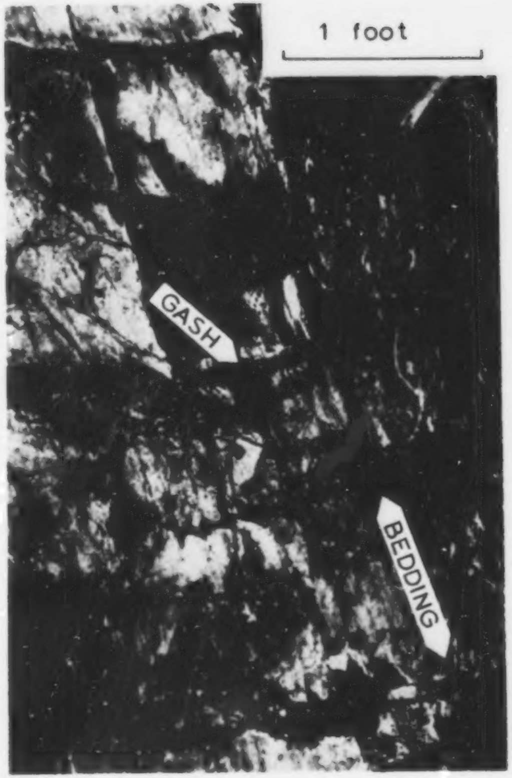

1 foot
GASH
BEDDING

Plate XIIA. Chalcopyrite-filled gash fractures cutting Hazelton beds, Copper Crown zone, Grouse Mountain.

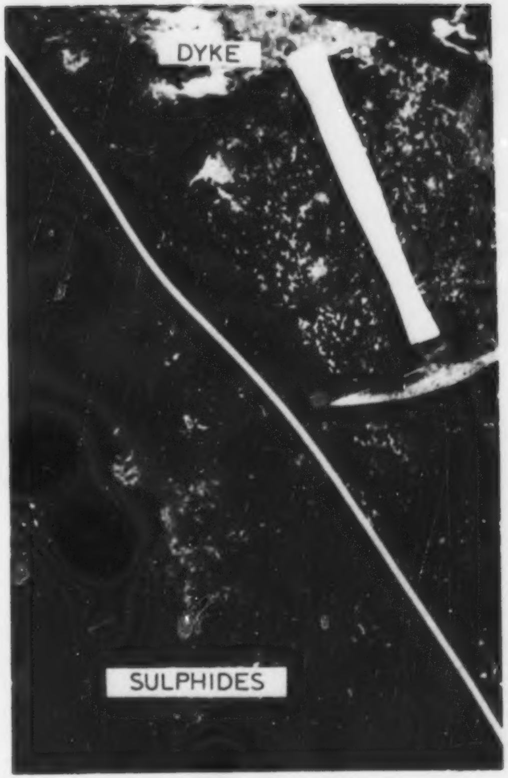

DYKE
SULPHIDES

Plate XIIB. Feldspar porphyry dyke in contact with sulphide mineralization, Ruby zone, Grouse Mountain.

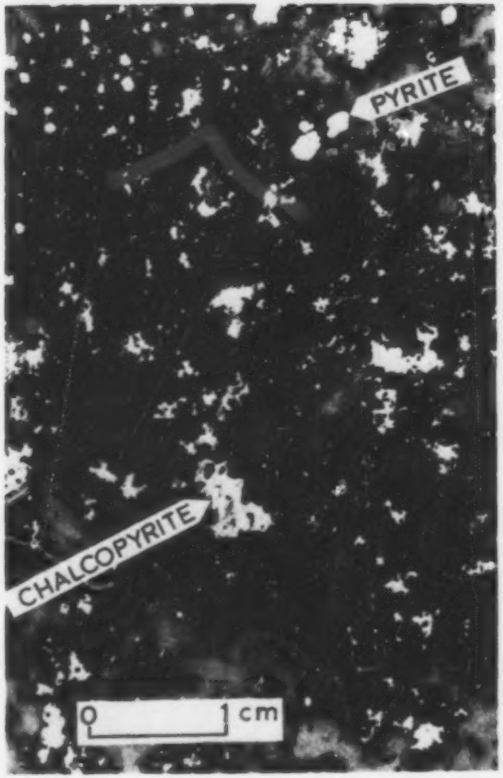

PYRITE
CHALCOPYRITE
0
1 cm

Plate XIIIA. Polished surface of vein quartz mineralized with pyrite and chalcopyrite, Ruby zone, Grouse Mountain.

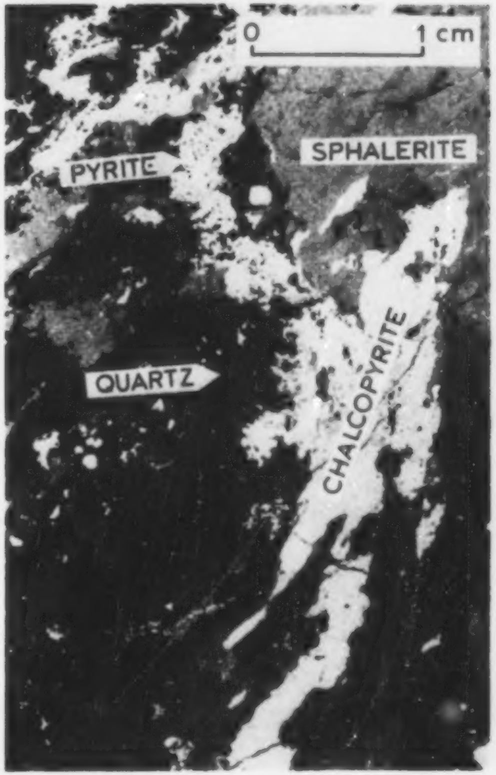

0
1 cm
SPHALERITE
PYRITE
QUARTZ
CHALCOPYRITE

Plate XIIIB. Polished surface showing concentrations of sphalerite, chalcopyrite, and pyrite in quartz; some wallrock breccia; Ruby zone, Grouse Mountain.

Movement on these fractures is generally slight, however, in a few cases important faults have been identified. For example, major northerly trending faults, following pronounced topographic lineaments, pass just west of the summit severing the east half of Grouse Mountain from the main mass. A wedge of volcanic conglomerate located one-half mile southeast of Coppermine Lake has been caught between these faults and rotated against the adjacent blocks.

Perhaps more significantly many fractures have simply opened, with little or no slip displacement, to accommodate numerous dykes and veins. The favoured direction of dyke intrusion is coincident with the northwesterly striking joint set, No. 3 in the above table. Barren quartz veins commonly fill northerly striking fractures subparallel to No. 6, whereas sulphide-bearing fissures often strike northeasterly subparallel to No. 4.

MINERALIZATION: The occurrence of sulphide mineralization on Grouse Mountain has been variously described as fissure veins, breccias, stratiform deposits, replacements, and more generally, zones of mineralization or showings.

The principal sulphides are pyrite, sphalerite, chalcopyrite, less commonly galena and, locally, tetrahedrite. These are usually accompanied by quartz and some carbonates.

Copper Crown Zone: The Copper Crown zone is a dilated segment, about 400 feet long, of a more extensive system of sulphide-bearing gash fractures which includes the Ruby zone 1,200 feet to the southwest (Fig. 52). Mineralization consists of subparallel lenses and joint fillings cutting sharply across bedding and distributed in varying concentrations over a maximum width of about 50 feet (Plate XIIA).

MacKenzie (1915, p. 66) describes the mineralization in detail:

> "At the initial post of the Copper Crown claim a sheeted zone 12 feet wide is made of closely spaced joints from ½ to 4 inches apart, most of which can be traced on the surface for 10 feet, and in some cases two or three times that far. Chalcopyrite occurs in the fissures in this zone, forming lenticular and irregular veinlets of the solid mineral, the largest seen being 3 inches thick, by 16 inches long. A shoot in the zone, 3 feet thick and 10 feet long, contained about 20 per cent chalcopyrite, and other, less rich shoots also occurred. Twenty-two feet east of the place just described, a 2-foot pit shows a shoot 4 feet thick, visible for 10 feet, which contains about 25 per cent chalcopyrite, and a 10-inch vein in the middle of the shoot, exposed for 5 feet, is nearly pure chalcopyrite. At a distance of 190 feet from the initial post mentioned, the continuation of the same zone is 35 feet wide, prospected by a shaft on the south side of the zone and a trench on the north side. The shaft is 5 by 6 by 8 feet deep, and exposes a 5-foot shoot that may run 20 per cent chalcopyrite. The rest of the 35 feet is lower grade ore, except for one or two small shoots, up to 18 inches thick.
>
> "Eastward from here a distance of about 100 feet are many short veinlets of chalcopyrite from ½ inch to 4 inches thick."

Average of assays of two grab samples collected by the writer containing 15 to 20 per cent sulphides was copper, 3.22 per cent; silver, 3.2 ounces per ton; and very low gold, lead, and zinc values.

Figure 52
GEOLOGY
OF THE
COPPER CROWN, RUBY
AND
SCHORN ZONES
GROUSE MOUNTAIN

LEGEND

BEDDED ROCKS
- GREYWACKE, SHALE
- TUFF, BRECCIA

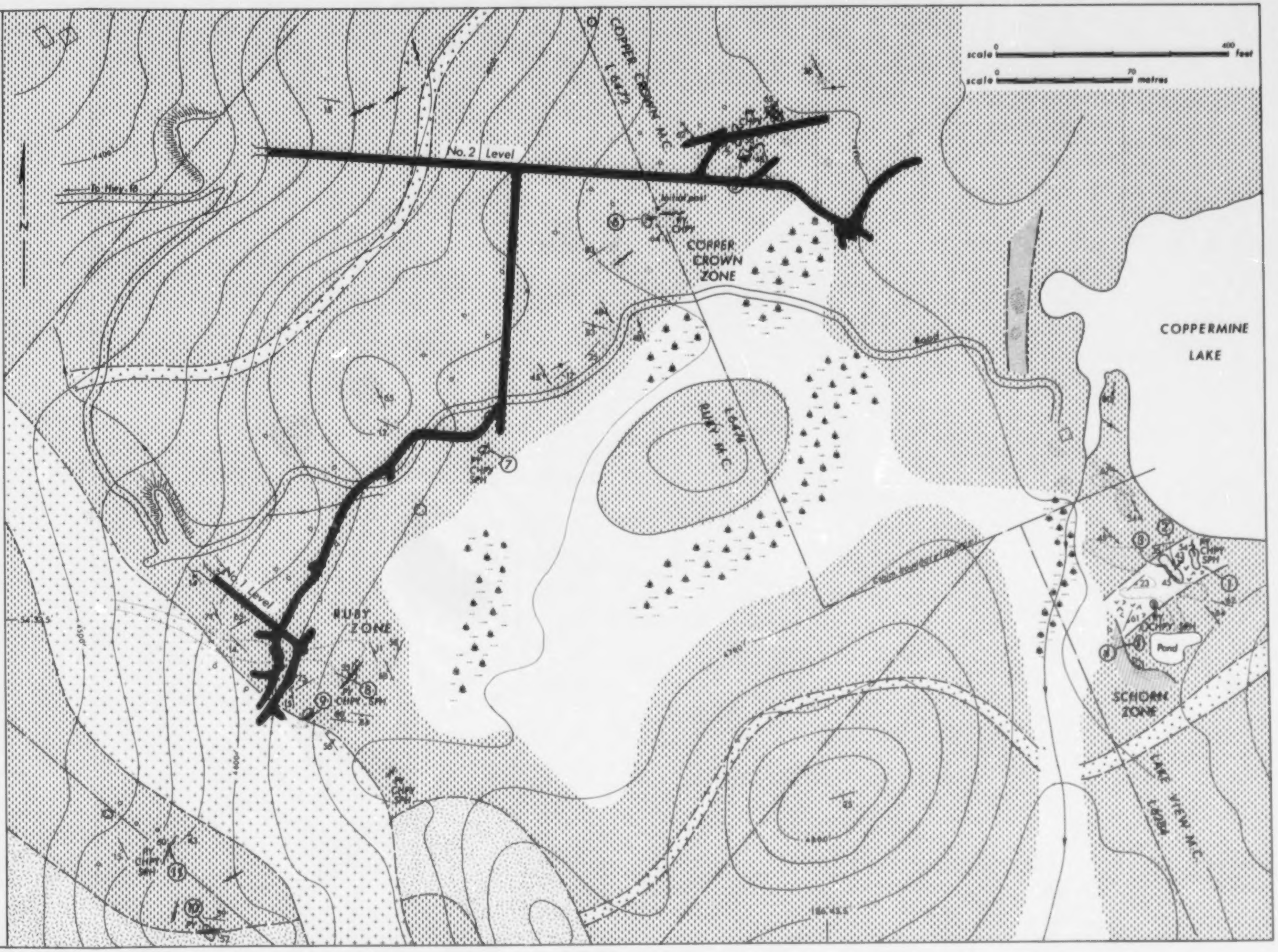
DYKES
- APHANITIC BASIC DYKE
- BLADED FELDSPAR PORPHYRY
- TABLET FELDSPAR PORPHYRY

PY PYRITE
CHPY CHALCOPYRITE
SPH SPHALERITE
BEDDING
JOINT
SHEAR
PORTAL
UNDERGROUND WORKING
□ BUILDING
◪ SHAFT
FORMATION CONTACT (APPROXIMATE)
CONTOUR (INTERVAL 25 FEET)
MINERALIZATION
SURVEYED EXPOSURE
MINE DUMP
SWAMP
STREAM
PIT
SURFICIAL EXCAVATION

ANALYSES (Mainly Grab Samples)

SAMPLE NO	Au oz/ton	Ag	Cu	Pb Weight %	Zn	Fe
1	Tr.	2.4	0.63	1.39	10.00	4.15
2	Tr.	3.4	1.00	0.03	9.10	3.88
3	Tr.	3.4	0.97		9.90	3.42
4	Tr.	15.8	3.00	0.17	10.90	11.08
5	Tr.	5.2	5.86	-	0.10	12.40
6	Tr.	1.2	8.80	-	0.07	10.30
7	Tr.	1.7	1.05	-	8.00	7.07
8	Tr.	4.3	1.80	0.03	9.20	8.80
9	0.01	12.3	4.39	-	7.40	10.30
10	0.04	5.7	1.34	0.30	10.40	8.32
11	0.01	4.5	0.96	0.08	1.31	8.40

As and Sb are less than 10 ppm and 5 ppm respectively for each sample.


scale 0 400 feet
scale 0 70 metres
N
To Hwy. 16
No. 2 Level
No. 1 Level
COPPER CROWN M.C. L.6479
COPPER CROWN ZONE
RUBY M.C. L.6476
RUBY ZONE
SCHORN ZONE
LAKE VIEW M.C. L.6384
COPPERMINE LAKE
Road
Pond
PY
CHPY
SPH
4500'
4600'
4800'

Ruby Zone: The detailed geology of the Ruby zone, shown on Figure 52, is based on information provided by MacKenzie (1915), Black (1951), and a chain and compass survey by the writer.

Black's investigation of the underground workings of the mine and drill core indicated that the Ruby zone continues to the southwest more or less from where the Copper Crown zone ends; the Ruby zone displaying an abundance of sphalerite considerably in excess of chalcopyrite.

The Ruby zone dips steeply to the northwest and is divided into three southwesterly raking shoots over a strike length of roughly 1,100 feet. The shoot furthest to the southwest appears to be best mineralized. It is terminated against the large bladed feldspar porphyry dyke, described earlier, and is cut by the younger tablet feldspar porphyry (Plate XIIB). Five samples of this shoot, taken by Black from the No. 1 level, show the following average composition: (width, 59 inches) gold, trace; silver, 2.3 ounces per ton; copper, 1.0 per cent; zinc, 12.1 per cent. A surface sample collected by the writer across a width of 66 inches in a trench 100 feet northeast of the tablet feldspar porphyry assayed: gold, trace; silver, 4.3 ounces per ton; copper, 1.80 per cent; lead, 0.03 per cent; zinc, 9.20 per cent; iron, 8.80 per cent. The sampled section is clearly banded displaying a layer adjacent the footwall composed mainly of quartz with scattered blebs of pyrite and chalcopyrite (Plate XIIIA) and toward the hangingwall masses of pyrite, chalcopyrite, and sphalerite alternating with solid and brecciated screens of country rock (Plate XIIIB).

To the northeast the zone widens considerably into a multi-vein system. This is evident from Black's description of core from a drill hole recording an intersection through the central shoot of 23 feet.

> "This length of core contains a vein 6 inches wide, a vein 2 inches wide, twenty-four veins about 1 inch wide, about twenty narrower veins in a 1-foot length of ore, and 1 foot of disseminated mineralization, largely sphalerite."

It appears that the veins and veinlets are concentrated toward the axial plane of the shoot. Nevertheless, the sulphides are relatively dispersed resulting in low metal values. An assay of a 36-inch-wide sample section provided by Black shows: gold, nil; silver, 0.5 ounce per ton; copper, 0.2 per cent; zinc, 7.0 per cent.

The northeasterly shoot is mostly obscured at surface by glacial cover. A sample obtained by Black from the underground workings assayed: (width, 18 inches) gold, trace; silver, 1.7 ounces per ton; copper, 0.9 per cent; zinc, 13.1 per cent. This compares favourably with a grab sample collected by the writer from a small surface showing: gold, trace; silver, 1.7 ounces per ton; copper, 1.05 per cent; lead, nil; zinc, 8.00 per cent; iron, 7.07 per cent.

Schorn Zone: The Schorn zone comprises an assortment of veins and veinlets partially exposed in a series of old water-filled and sloughed pits and open cuts. These excavations extend northeasterly at about 025 degrees azimuth from the contact of an aphanitic basic dyke almost 220 feet to a point near the southwest shore of Coppermine Lake (Fig. 52). This alignment of trenches and associated mineralization cuts across gently dipping beds of dark brown tuff and grey siltstones.

The apparent main vein, exposed in the trenches at the northeast end of the zone, is about 10 inches wide consisting mostly of quartz and some mineralized wallrock with about 17 per cent combined pyrite, chalcopyrite, and sphalerite. An assay of this material shows the following results: gold, trace; silver, 3.4 ounces per ton; copper, 1.00 per cent; lead, 0.03 per cent; zinc, 9.10 per cent; iron, 3.86 per cent. A grab sample of similarly mineralized dump material from the pit near the dyke assayed: gold, trace; silver, 15.8 ounces per ton; copper, 3.60 per cent; lead, 0.17 per cent; zinc, 10.90 per cent; iron, 11.05 per cent. Two small cross-veins assayed: gold, trace; silver, 2.4 ounces per ton; copper, 0.63 per cent; lead, 1.39 per cent; zinc, 10.00 per cent; iron, 4.15 per cent; and gold, trace; silver, 3.4 ounces per ton; copper, 0.97 per cent; lead, nil; zinc, 9.90 per cent; iron, 3.42 per cent.

Lakeview Zone: The Lakeview showing consists essentially of two quartz veins, locally enriched in chalcopyrite and sphalerite, exposed near the south shore of Coppermine Lake. These veins strike across gently dipping greywacke and siltstone beds toward an aphanitic basic dyke about 250 feet to the southwest (Fig. 53).

The east vein has been explored by a short adit, about 20 feet long, near lake level and an open cut immediately above. A sample containing about 30 per cent sulphides secured from a segment of the vein, about 3.5 feet wide, at the open cut assayed: gold, trace; silver, 5.2 ounces per ton; copper, 2.28 per cent; lead, 0.08 per cent; zinc, 13.60 per cent; and iron, 7.20 per cent.

A second vein, about 60 feet to the west, has been traced approximately 80 feet by another adit 25 feet above lake level. Black (1951, p. A117) provides two assays on samples taken midway along this vein across widths totalling 9 feet 5 inches; these yield the following average: gold, trace; silver, 4.0 ounces per ton; copper, 1.7 per cent; zinc, 18.1 per cent.

Eureka Showing: This is a pyrite-chalcopyrite-quartz vein system dipping about 75 degrees northwest and striking 070 degrees subparallel to the central part of the north shore line of Coppermine Lake (Fig. 49). The geological setting is similar to the Lakeview and Schorn zones; beds of tuffaceous sedimentary rock are cut by an aphanitic basic dyke near the veins.

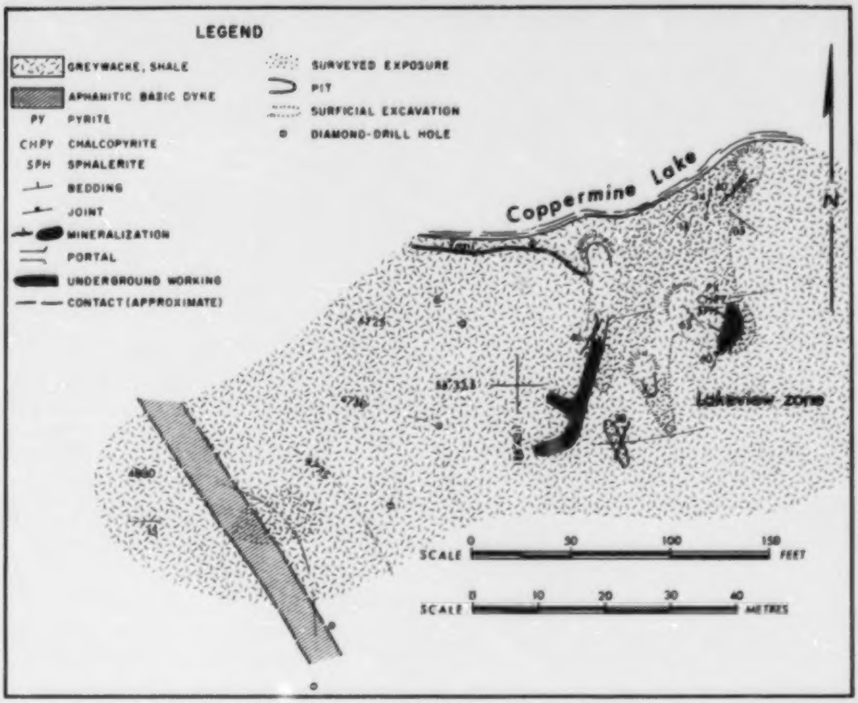

LEGEND
GREYWACKE, SHALE
APHANITIC BASIC DYKE
PY PYRITE
CHPY CHALCOPYRITE
SPH SPHALERITE
BEDDING
JOINT
MINERALIZATION
PORTAL
UNDERGROUND WORKING
CONTACT (APPROXIMATE)
SURVEYED EXPOSURE
PIT
SURFICIAL EXCAVATION
DIAMOND-DRILL HOLE
Coppermine Lake
N
PY
CHPY
SPH
Lakeview zone
SCALE
0
50
100
150
FEET
SCALE
0
10
20
30
40
METRES

Figure 53. Geology of the Lakeview zone on Lakeview (Lot 6294).

The mineralization was intersected in a crosscut adit (now caved) driven from lake level. On surface a vein was traced about 300 feet to the northeast following a line of old sloughed trenches.

MacKenzie (1915, p. 67) provides a detailed description of an open cut in the area above the adit:

> "....Following is a section of the zone, from the hanging-wall to the foot-wall:
>
> | | |
> |---|---|
> | Chalcopyrite, pyrite, and quartz | 6 inches |
> | Rock, slightly and irregularly mineralized | 6 inches |
> | Ore shoot, about 25 per cent chalcopyrite | 2 feet |
> | Rock, slightly and irregularly mineralized | 2 feet |
> | Ore shoot, about 25 per cent chalcopyrite | 5 feet." |

A sample across a width of 5 feet at the base of this cut assayed: gold, trace; silver, 4.8 ounces per ton; copper, 6.2 per cent (*Minister of Mines, B.C.*, Ann. Rept., 1914, p. K228).

Hidden Treasure Showing: The Hidden Treasure showing is at about 4,600 feet elevation on the west side of a deep gully about 1,000 feet northeast of North Lake.

Mineralization consists of pyrite, chalcopyrite, galena, and sphalerite impregnations in a steeply dipping shear zone varying from 2 to 6 feet wide. The zone strikes about 030 degrees cutting a sequence of moderately folded argillites and tuffaceous rocks. The sulphides follow the shears to a point about 40 feet above a short adit where the mineralization diverges and is parallel to bedding at the base of a thick pyroclastic deposit.

The best mineralization is concentrated in the schist near a crosscutting westerly dipping felsite dyke. Assay results on two sulphide-rich samples are recorded in the Minister of Mines Annual Report for 1928 (p. C169); a galena-rich sample ran: gold, trace; silver, 5 ounces per ton; copper, 1.5 per cent; lead, 24 per cent; zinc, 11 per cent; and a pyrite-chalcopyrite concentrate: gold, trace; silver, 1.6 ounces per ton; copper, 4.3 per cent.

Rainstorm Zone: The Rainstorm zone is situated immediately north of the Crown-granted claims owned by Copper Ridge Mines Ltd. (Fig. 49).

The main showing is just south of the road to North Lake 200 feet east of the turnoff (Fig. 54). This consists of shallow-dipping sulphide-rich lenses near the base of an andesitic pyroclastic unit above a thick sequence of grey siltstones and volcanic wackes. A sample taken across a width of 3 feet on the wall of an old pit testing three narrow seams composed essentially of pyrite, sphalerite, and quartz assayed: gold, trace; silver, 0.2 ounce per ton; copper, 0.09 per cent; lead, 0.04 per cent; zinc, 5.90 per cent; iron, 7.07 per cent.

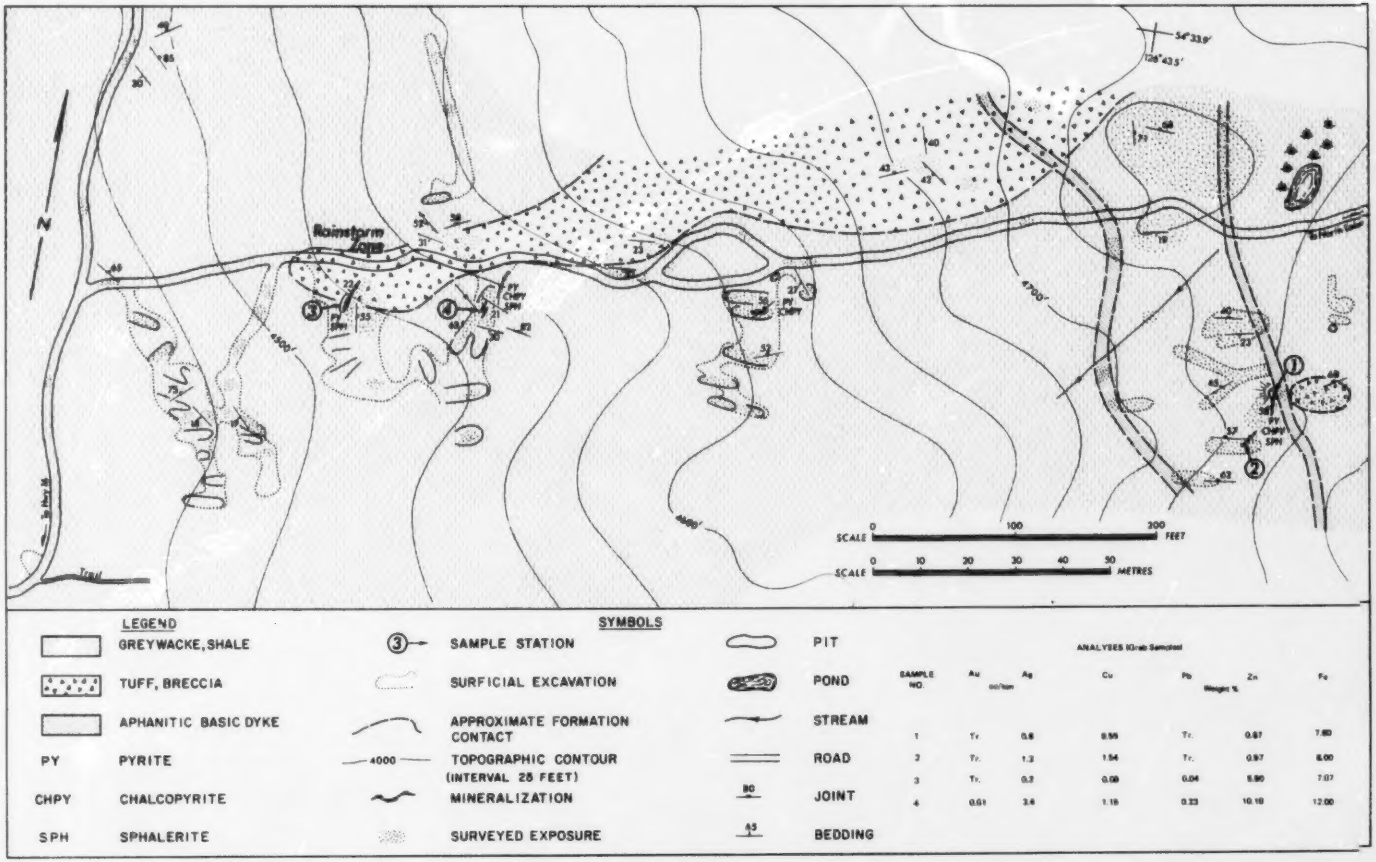
The same showing has been briefly described in the Minister of Mines Annual Report for 1926, page A135:

> "Mineralization is that characteristic of the vicinity—namely, zinc-blende, iron pyrites, and a little chalcopyrite, following the bedding-planes of andesitic breccias and tuffs and striking N. 50° E. (mag.). The main point of exposure shows a width of 23 feet, although mineralization is not heavy at all points of this width. A picked sample assayed: Gold, trace; silver, 0.2 oz. to the ton; lead, trace; zinc, 13 per cent."

Immediately to the east where erosion has stripped away the andesite two additional mineral showings are exposed in the sedimentary rocks. These consist of small veinlets of pyrite, chalcopyrite, and sphalerite cutting sharply across gently dipping beds. Assay results on a well-mineralized sample show: gold, 0.01 ounce per ton; silver, 3.4 ounces per ton; copper, 1.15 per cent; lead, 0.23 per cent; zinc, 10.10 per cent; iron, 12.00 per cent.

A fourth showing, still further east, consists of a few small veins leading away from the contact of an aphanitic basic dyke which intrudes the sedimentary succession and an outlier of the andesite. The average of two assays of typical samples is: gold, trace; silver, 0.9 ounce per ton; copper, 1.05 per cent; lead, trace; zinc, 0.82 per cent; iron, 7.80 per cent.

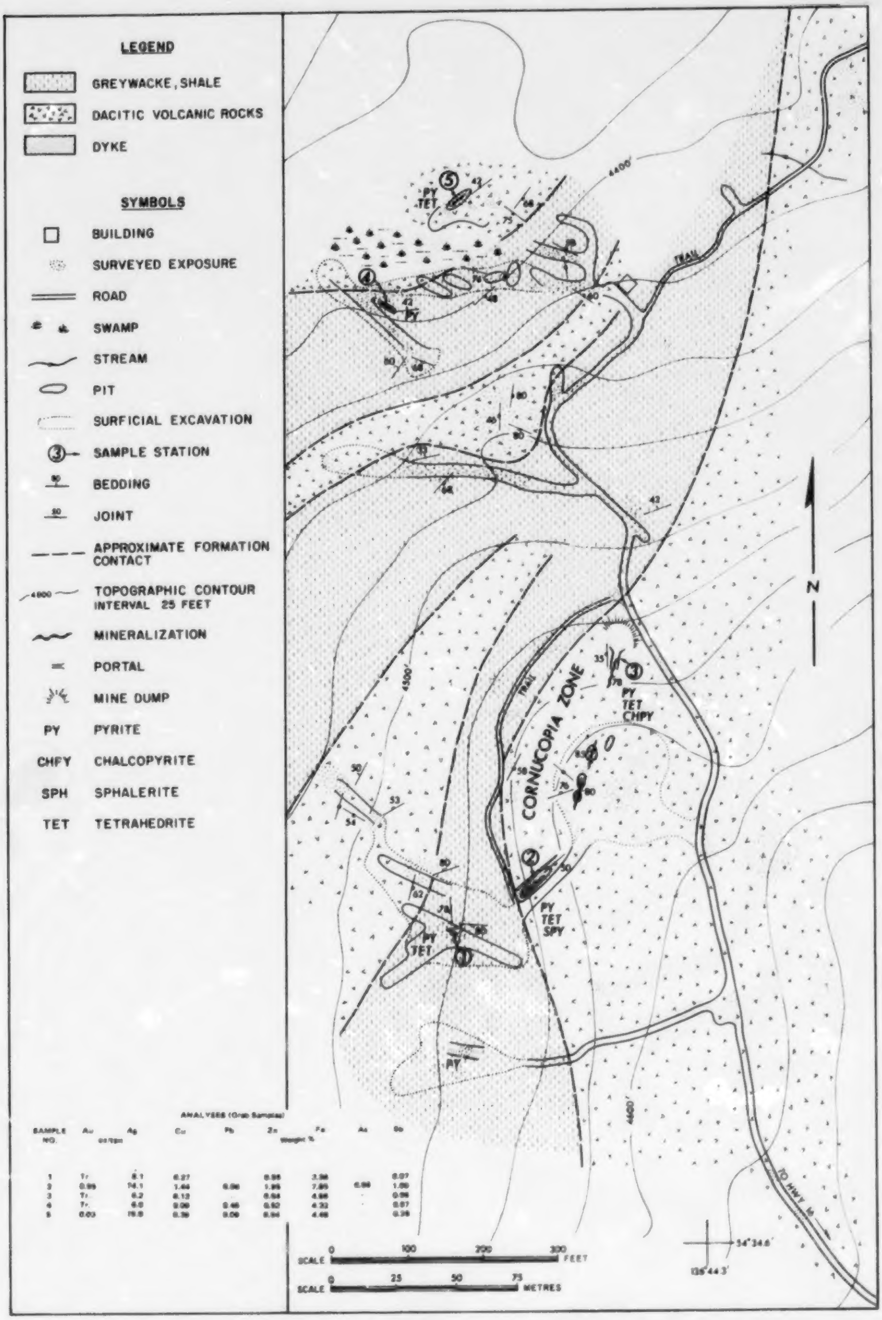
Cornucopia Zone: The Cornucopia zone comprises a number of small showings on the northwest slope of Grouse Mountain between 4,400 and 4,600 feet elevation (Fig. 49). These consist of narrow silver-bearing quartz veins and breccias following joints and shears developed in an alternating sequence of dacitic volcanic rocks, siltstones, and argillites (Fig. 55).


N
54°33.9'
126°43.5'
Rainstorm Zone
Trail
4500'
4600'
4700'
PY
CHPY
SPH
SCALE 0 100 200 FEET
SCALE 0 10 20 30 40 50 METRES
LEGEND
GREYWACKE, SHALE
TUFF, BRECCIA
APHANITIC BASIC DYKE
PY PYRITE
CHPY CHALCOPYRITE
SPH SPHALERITE
SYMBOLS
SAMPLE STATION
SURFICIAL EXCAVATION
APPROXIMATE FORMATION CONTACT
4000 TOPOGRAPHIC CONTOUR (INTERVAL 25 FEET)
MINERALIZATION
SURVEYED EXPOSURE
PIT
POND
STREAM
ROAD
80 JOINT
65 BEDDING

ANALYSES (Grab Samples)

SAMPLE NO.	Au oz/ton	Ag oz/ton	Cu Weight %	Pb Weight %	Zn Weight %	Fe Weight %
1	Tr.	0.8	0.55	Tr.	0.87	7.80
2	Tr.	1.3	1.54	Tr.	0.97	8.00
3	Tr.	0.2	0.09	0.04	5.90	7.07
4	0.01	3.6	1.19	0.23	10.10	12.00

Figure 54. Geology of the Rainstorm zone, Grouse Mountain.


LEGEND
GREYWACKE, SHALE
DACITIC VOLCANIC ROCKS
DYKE
SYMBOLS
BUILDING
SURVEYED EXPOSURE
ROAD
SWAMP
STREAM
PIT
SURFICIAL EXCAVATION
SAMPLE STATION
BEDDING
JOINT
APPROXIMATE FORMATION CONTACT
TOPOGRAPHIC CONTOUR INTERVAL 25 FEET
MINERALIZATION
PORTAL
MINE DUMP
PY PYRITE
CHPY CHALCOPYRITE
SPH SPHALERITE
TET TETRAHEDRITE
CORNUCOPIA ZONE
TRAIL
4400'
4500'
N
TO HWY 16
PY
TET
CHPY
SPY
SCALE 0 100 200 300 FEET
SCALE 0 25 50 75 METRES
54°34.6'
135°44.3'

ANALYSES (Grab Samples)

SAMPLE NO.	Au oz/ton	Ag oz/ton	Cu weight %	Pb weight %	Zn weight %	Fe weight %	As weight %	Sb weight %
1	Tr	8.1	0.27		0.95	2.38		0.07
2	0.95	74.1	1.44	0.06	1.95	7.85	0.08	1.00
3	Tr	6.2	0.12	-	0.04	4.66	-	0.06
4	Tr	6.0	0.06	0.46	0.02	4.22	-	0.07
5	0.03	19.8	0.39	0.06	0.04	4.48		0.28

Figure 55. Geology of the Cornucopia zone, Grouse Mountain.

The principal mineralization is found in a steep northeasterly striking quartz-carbonate vein adjacent a dyke of intermediate composition. This was explored by an adit and surface trenching for a length of 200 feet. According to the Annual Report of the Minister of Mines for 1925 (p. A140):

> "The high-grade mineral occurs in a vein which varies in width from 6 to 15 inches and which shows in places grey copper, specular iron, and copper-stains. A sample of the best mineral showing assayed: gold, 1.7 ounces per ton; silver, 204 ounces per ton; copper, 6.5 per cent."

A grab sample of the vein taken by the writer in the vicinity of the portal assayed: gold, trace; silver, 6.2 ounces per ton; copper, 0.12 per cent; lead, nil; zinc, 0.04 per cent; iron, 4.96 per cent; antimony, 0.06 per cent. Another sample from an open cut on an apparent extension of the vein, about 300 feet southeast of the portal, yielded: gold, 0.05 ounce per ton; silver, 74.1 ounces per ton; copper, 1.44 per cent; lead, 0.06 per cent; zinc, 1.95 per cent; iron, 7.85 per cent; arsenic, 0.09 per cent; antimony, 1.00 per cent.

A detailed account under the name 'Last Chance Claims' is given in the Annual Report of the Minister of Mines for 1937 (pp. C11, C12).

Additional mineralization is exposed in a bulldozer trench about 400 feet southwest of the portal. This is a northerly trending zone of shattered siltstone cemented by milk quartz with accompanying pyrite and argentiferous tetrahedrite (*see* accompanying X-ray results). Two similar but poorly exposed occurrences are found in altered dacitic tuff and carbonaceous shales near a small swamp at the base of a steep slope about 600 feet northwest of the portal. The average assay of three grab samples from the breccias is: gold, trace; silver, 16.5 ounces per ton; copper, 0.25 per cent; lead, 0.18 per cent; zinc, 0.50 per cent; iron, 4.06 per cent; antimony, 0.14 per cent.

SPECULATION ON THE SOURCE OF MINERALIZATION: It seems clear that mineralization is very much fracture controlled in the Grouse Mountain area. The deposits appear to be simply the result of solutions moving upward and along the developed fracture system, filling dilatant joints and gashes and locally replacing some walls. In the few cases where sulphides are found subparallel to bedding planes, it seems likely that the upward egress of hydrothermal solutions was locally blocked causing some lateral flow and mineralization.

The source of mineralizing solutions is unknown, however, several lines of evidence suggest that they may be distillates of a deeply buried stock. For example, it appears that many of the dykes and veins on Grouse Mountain were emplaced about the same time into a pre-existing system of geometrically related fractures. Spatially, veins are often found close to dykes; some mineralization is actually found along dyke contacts and in many cases the veins strike off abruptly from contacts. Chemical and mineralogical evidence suggests that the dykes are consanguineously related possibly differentiates of a common syenomonzonite-gabbro magma of the Goosly type.

REFERENCES: Lang, A. H. (1941), *Geol. Surv., Canada,* Paper 40-18; MacKenzie, J. D. (1915), *Geol. Surv., Canada,* Sum. Rept., pp. 65-67; Hanson, G. (1924), *Geol. Surv., Canada,* Sum. Rept., Pt. A, pp. 19A-37A; Grove, E. W., *B.C. Dept. of Mines & Pet. Res.,* Bull. 62 (in preparation); *Minister of Mines, B.C.,* Ann. Rept., 1914, pp. K227, K228; 1916, p. K126; 1917, p. F111; 1923, p. A113; 1924, p. B97; 1925, p. A140; 1926, p. A135; 1927, p. C138; 1928, p. C169; 1929, p. C169; 1937, pp. C11, C12; 1951, pp.

X-RAY ANALYSIS

1*		2	
I	dÄ	I	dÄ
1	5.10	½	5.2
1	4.15		......
1	3.62	1	3.69
2	3.310		......
10	2.980	10	3.00
1	2.755	½	2.78
2	2.585	2	2.61
1	2.443	1	2.46
½	2.310	1	2.33
½	2.265		......
½	2.212		......
½	2.113	1	2.12
2	2.027	1	2.04
1	1.892	1	1.895
8	1.828	6	1.831
½	1.824		......
½	1.777	½	1.784
	......	½	1.722
3	1.684	½	1.687
	......	½	1.647
8	1.563	½	1.563
½	1.537		......
½	1.501	½	1.501
½	1.475		......
	......	½	1.467
½	1.416	½	1.410
½	1.368	½	1.368
½	1.325		......

1 – Argentiferous tetrahedrite from the Cornucopia zone, Grouse Mountain; analysis by B. N. Church, British Columbia Department of Mines and Petroleum Resources.

2 – Tetrahedrite, ASTM data card No. 11-107.

*Semiquantitative spectrographic analysis on No. 1:

Cu	more than 20 per cent	Zn	4 per cent
Ag	present in abundance	As	3 per cent
Fe	3 per cent	Sb	more than 20 per cent

113-117; 1952, p. 94; *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, pp. 158, 159; Assessment Report 726.

DAY (No. 147, Fig. D)

LOCATION: Lat. 54° 30′-33′ Long. 126° 44′-47′ (93L/10)
OMINECA M.D. Near Fishpan Lake, 10 miles north-northwest of Houston.

CLAIMS: DAY 1 to 75.

ACCESS: By road from Houston, 10 miles.

OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

DESCRIPTION: The property is underlain by Jurassic volcanic rocks. There is virtually no outcrop except at the northwest corner of the claims. The Huber-Mineral Hill silver-lead-zinc and molybdenum showings are situated east of the property boundary.

WORK DONE: Percussion drilling, six holes totalling 1,450 feet on Day 2, 5, 14, 32, 56, and 73.

SK (No. 92, Fig. D)

LOCATION: Lat. 54° 44.6′ Long. 126° 36′ (93L/10W, 15E)
OMINECA M.D. At approximately 4,200 feet elevation on the east side of Dome Mountain, 20 miles east of Smithers.

CLAIMS: E 1 to 32, GOLD ROCK 1 to 6.

ACCESS: By helicopter from Smithers, 20 miles.

OWNER: AMOCO CANADA PETROLEUM COMPANY LTD., 2160, 1055 West Hastings Street, Vancouver 1.

METALS: Gold, silver, lead, zinc, copper.

DESCRIPTION: Altered green and purple tuffs of the Hazelton Group are intruded by a quartz porphyry body. Quartz veins are present with pyrite, sphalerite, and galena. Minor chalcopyrite occurs in tuffs.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; induced polarization survey, 13.13 line-miles; ground magnetometer survey, 12.73 line-miles; and geochemical silt, soil, water, and rock survey, 370 samples covering all claims.

REFERENCE: *Minister of Mines, B.C.*, Ann. Rept., 1967, p. 90.

LAVA (No. 97, Fig. D)

LOCATION: Lat. 54° 31′ Long. 127° 07′ (93L/11E)
OMINECA M.D. Between 4,000 and 6,000 feet elevation near Loring and Webster Creeks, 12 miles south of Telkwa.

CLAIMS: FRED 1 to 22, OLD TOM 1 and 2, CRATER A1 to H8, MARLA 1 to 4, MARMOT 1 to 14.

ACCESS: By helicopter from Smithers, 20 miles.

(93L/11E)

OWNER: MAHARAJA MINERALS, LIMITED, 1102, 207 West Hastings Street, Vancouver 3.

METALS: Copper, molybdenum.

DESCRIPTION: Flat-lying Hazelton volcanic rocks are intruded by granodiorite and diorite dykes and plugs. The largest plug contains disseminated chalcopyrite and molybdenite on fractures.

WORK DONE: Trenching, 6,200 feet on Fred, Marla and Old Tom claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 86; 1970, p. 159.

HB, AJ (No. 171, Fig. D)

LOCATION: Lat. 54° 31' Long. 127° 10' (93L/11E)

OMINECA M.D. Between 4,300 and 7,500 feet elevation in Hunter Basin in the Telkwa Range, 18 miles due south of Smithers.

CLAIMS: HB 1 to 26, 28 to 48, 50, AJ 1 to 6.

ACCESS: By road from Telkwa, 16 miles.

OWNER: HUNTER BASIN MINES LTD., 601, 207 West Hastings Street, Vancouver 3.

METALS: Gold, silver, copper.

DESCRIPTION: Hazelton volcanic rocks are cut by fractures and intruded by stocks and related felsite dykes. Vein-type mineralization predominates.

WORK DONE: Stripping, 750 feet.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 176.

HOS (No. 12, Fig. D)

LOCATION: Lat. 54° 35' Long. 127° 24' (93L/11W)

OMINECA M.D. At approximately 4,000 feet elevation 2.5 miles southwest of the junction of Howson Creek and Telkwa River, 20 miles southwest of Smithers.

CLAIMS: HOS 15, 17, 19, 21, 23, 31-40, 44, 46 to 50, 59 to 62, 65 to 76.

ACCESS: By secondary and logging roads from Telkwa, 17 miles.

OWNER: BRANTA EXPLORATIONS LTD., 206, 846 West Hastings Street, Vancouver 1.

METALS: Copper (gold, silver).

DESCRIPTION: Chalcocite and bornite are associated with fractured granitic dykes and pyritic zones in Hazelton volcanic rocks contain values in gold, silver, and copper.

WORK DONE: Trenching and reconnaissance geochemical survey during 1971; geochemical soil survey, 386 samples covering Hos 15, 17, 19, 35, 37, 39 and 67 to 76 during 1972.

REFERENCE: Assessment Report 3583.

JANET, STOCK, LORNE (COPPER QUEEN) (No. 8, Fig. D)

LOCATION: Lat. 54° 41' Long. 127° 28' (93L/11W)

OMINECA M.D. At 5,300 feet elevation near the headwaters of Winfield Creek, 17 miles west of Telkwa.

(93L/14W)

CLAIMS: JANET, STOCK, LORNE, TABLE, KEN, DON, etc., totalling 100.

ACCESS: By road from Telkwa, 30 miles.

OWNER: Copper Queen Explorations Ltd.

OPERATOR: TEXASGULF, INC., 704, 535 Thurlow Street, Vancouver 5.

METALS: Copper, silver.

DESCRIPTION: The property is underlain by Jurassic volcanic rocks ranging in composition from andesite to rhyolite. The principal showings consist of quartz veins, fractures, and fault breccias containing chalcocite and chalcopyrite.

WORK DONE: Geological mapping, 1 inch equals 400 feet; geochemical survey covering Table 1-5, Ken 4, 6, 8, and Monty 1, 3, 5, 8, 10.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 160; Assessment Reports 3545, 3880.

GUY (No. 44, Fig. D)

LOCATION: Lat. 54° 47' Long 127° 26' (93L/14W)
OMINECA M.D. On Dennis Lake, 11 miles west of Smithers.

CLAIMS: GUY 1 to 35.

ACCESS: By road from Smithers, 14 miles.

OWNER: DELBROOK MINES LIMITED, 2706, 614 Fifth Avenue SW., Calgary, Alta.

WORK DONE: Induced polarization survey on Guy 5, 7, 9, and 24.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 163; Assessment Report 3873.

GLACIER GULCH (No. 116, Fig. D)

By W. G. Clarke

LOCATION: Lat. 54° 49' Long. 127° 18' (93L/14W)
OMINECA M.D. Between 3,000 and 4,000 feet elevation in Glacier Gulch, on the east side of Hudson Bay Mountain, 5 miles northwest of Smithers.

CLAIMS: Six mineral leases and 262 claims.

ACCESS: By road from Smithers, 8 miles.

OWNER: CLIMAX MOLYBDENUM CORPORATION OF BRITISH COLUMBIA, LIMITED, Box 696, Smithers.

METALS: Molybdenum, tungsten.

DESCRIPTION: Molybdenite, scheelite-powellite, wolframite, and chalcopyrite occur in quartz-vein sheetings and stockworks cutting Hazelton volcanic rocks and younger intermediate to acidic intrusive rocks.

WORK DONE: A crew of seven worked from July to October driving 762 feet of 8-foot by 8-foot drift and cutting a diamond drill station. Geological maps were made of this and other headings. Diamond drilling started in November and by the end of the year 3,856 feet had been drilled in three holes.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1966, pp. 86-90; 1967, p. 90;

1968, p. 120; *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 85; 1970, p. 163; 1971, p. 177.

BC (No. 158, Fig. D)

LOCATION: Lat. 54° 45.5'-47' Long. 126° 53'-58' (93L/15W)
OMINECA M.D. On Canyon Creek, 3 miles south of Astlais Mountain, 8 miles east of Smithers.
CLAIMS: BC 1 to 72.
ACCESS: By gravel road from Smithers, 13 miles.
OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.
DESCRIPTION: Outcrops are found only on the southwestern part of the claim block and comprise felsic intrusive rocks containing minor pyrite.
WORK DONE: Percussion drilling, seven holes totalling 1,608 feet on BC 1, 5, 22, 46, 48, and 51.

DRIFT (No. 33, Fig. D)

LOCATION: Lat. 54° 52.1' Long. 126° 57' (93L/15W)
OMINECA M.D. On Harvey Creek, a tributary of Driftwood Creek, 12 miles northeast of Smithers.
CLAIMS: DRIFT 1 to 40.
ACCESS: By the Babine Lake and Driftwood Creek roads from Smithers.
OWNER: DRIFTWOOD MINES LTD., 1130 Toronto-Dominion Tower, 1700 West Georgia Street, Vancouver 5.
METALS: Copper, silver.
DESCRIPTION: Chalcopyrite, bornite, and tetrahedrite occur in quartz veins and silicified zones in Hazelton Group volcanic rocks.
WORK DONE: Line-cutting on Drift 3-6.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 178; Assessment Report 3768.

CRONIN MINE (No. 193, Fig. D)

By W. G. Clarke

LOCATION: Lat. 54° 55.3' Long. 126° 48.5' (93L/15W)
OMINECA M.D. On the east slope of Mount Cronin.
CLAIMS: SUNRISE NO. 7 Crown-granted claim and seven located claims held under option.
ACCESS: By road from Smithers, 30 miles.
OWNER: KINDRAT MINES LTD., R.R. 2, Adams Road, Smithers.
METALS: Gold, silver, lead, zinc, cadmium (production shown on Table I).
DESCRIPTION: The mineral occurrence is the presence of galena and sphalerite together with other sulphides in quartz veins in a stock-like body of rhyolite at its contact with surrounding sedimentary rocks. A detailed geological report of this property may be found in the Annual Report of the

Minister of Mines for 1949.

WORK DONE: The mine was re-opened on May 1 and worked until September 30 when it closed for the season owing to an early heavy snowfall. Thirty-five feet of drifting and 60 feet of raising were done on the No. 1 vein above the rehabilitated No. 1 adit. Some stripping was done on an outcrop 1,500 feet southwest of the underground workings. Three miles of the access road was improved.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 100; 1970, p. 164; 1971, p. 178.

A (No. 132, Fig. D)

LOCATION: Lat. 54° 59' - 55° 01' Long. 126° 45.5'-47' (93L/15W; 93M/2W)
OMINECA M.D. At approximately 3,200 feet elevation near Debenture Creek, 4 miles northwest of Chapman Lake, 24 miles north-northeast of Smithers.

CLAIMS: A 1 to 45.

ACCESS: By helicopter from Smithers, 24 miles.

OWNER: AMOCO CANADA PETROLEUM COMPANY LTD., 2160, 1055 West Hastings Street, Vancouver 1.

DESCRIPTION: Green tuffs, pebble conglomerate, and white rhyolite of probable Hazelton Group occur on the claim group.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; induced polarization survey, 11.82 line-miles covering 28 claims; ground magnetometer survey, 10.9 line-miles covering all claims; geochemical silt, soil, water, and rock survey, 370 samples covering 28 claims.

HAL (No. 95, Fig. D)

LOCATION: Lat. 54° 50' Long. 126° 15' (93L/16W)
OMINECA M.D. At approximately 2,900 feet elevation 3 miles north of Fulton Lake, 5 miles west of Babine Lake.

CLAIMS: HAL 1 to 30.

ACCESS: By helicopter from Topley Landing, 7 miles.

OWNER: W. R. Bacon.

OPERATOR: LUC SYNDICATE, 1720, 1055 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The property is underlain by a sequence of Triassic (?) sedimentary and volcanic rocks. Volcanic fragments in float indicate minor copper mineralization along fractures.

WORK DONE: Geochemical soil survey, 815 samples covering all claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 168 (O claims); Assessment Report 2457.

FULL (No. 176, Fig. D)

LOCATION: Lat. 54° 50.5'-52' Long. 126° 19.5'-23' (93L/16W)
OMINECA M.D. One mile north of Fulton Lake, 6 miles southwest of Granisle.

CLAIMS: FULL 1 to 48.

ACCESS: By helicopter from Smithers, 35 miles.

OWNER: CITIES SERVICE MINERALS CORPORATION, 405, 1200 West Pender Street, Vancouver 1.

WORK DONE: Geochemical survey.

REFERENCE: Assessment Report 4193.

M (No. 101, Fig. D)

By N. C. Carter

LOCATION: Lat. 54° 52.5'-54.5' Long. 126° 23'-27' (93L/16W)
OMINECA M.D. At 3,000 feet elevation approximately 1 mile north of Saturday Lake, 30 miles northeast of Smithers.

CLAIMS: M 1 to 44, R 1 to 10, O 1 to 15.

ACCESS: By helicopter from Smithers, 30 miles.

OWNER: AMOCO CANADA PETROLEUM COMPANY LTD., 2160, 1055 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION:

The area covered by the claims is one of low relief. Rock exposures are found on low hills and ridges and along Broughton Creek (Fig. 56). Much of the area is underlain by Hazelton Group volcanic and sedimentary rocks which have been intruded by fine-grained crowded hornblende-biotite feldspar porphyries typical of the Babine Lake area.

South of Broughton Creek the porphyries occur as small plugs and dykes. An extrusive equivalent of these porphyries is a 300-foot-thick sheet of hornblende feldspar porphyry with prominent columnar jointing which is situated just west of Friday Lake.

Dykes of hornblende-biotite feldspar porphyry, biotite feldspar porphyry, and hornfelsed volcanic rocks were intersected during the 1972 drilling programme. Most of the rocks in this area contain magnetite, and pyrite and minor chalcopyrite were noted on fractures. Secondary biotite, altering from hornblende, was noted in the biotite feldspar porphyry.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; induced polarization survey, 42.33 line-miles; ground magnetometer survey, 42.33 line-miles; ground electromagnetic survey, 42.33 line-miles; and geochemical silt, soil, water, and rock survey, 975 samples covering all claims; surface diamond drilling, 14 holes totalling 4,709 feet on R 8 and 9 and O 3 and 5.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, Map 69-1, Geological Compilation of the Smithers, Hazelton, and Terrace Areas.

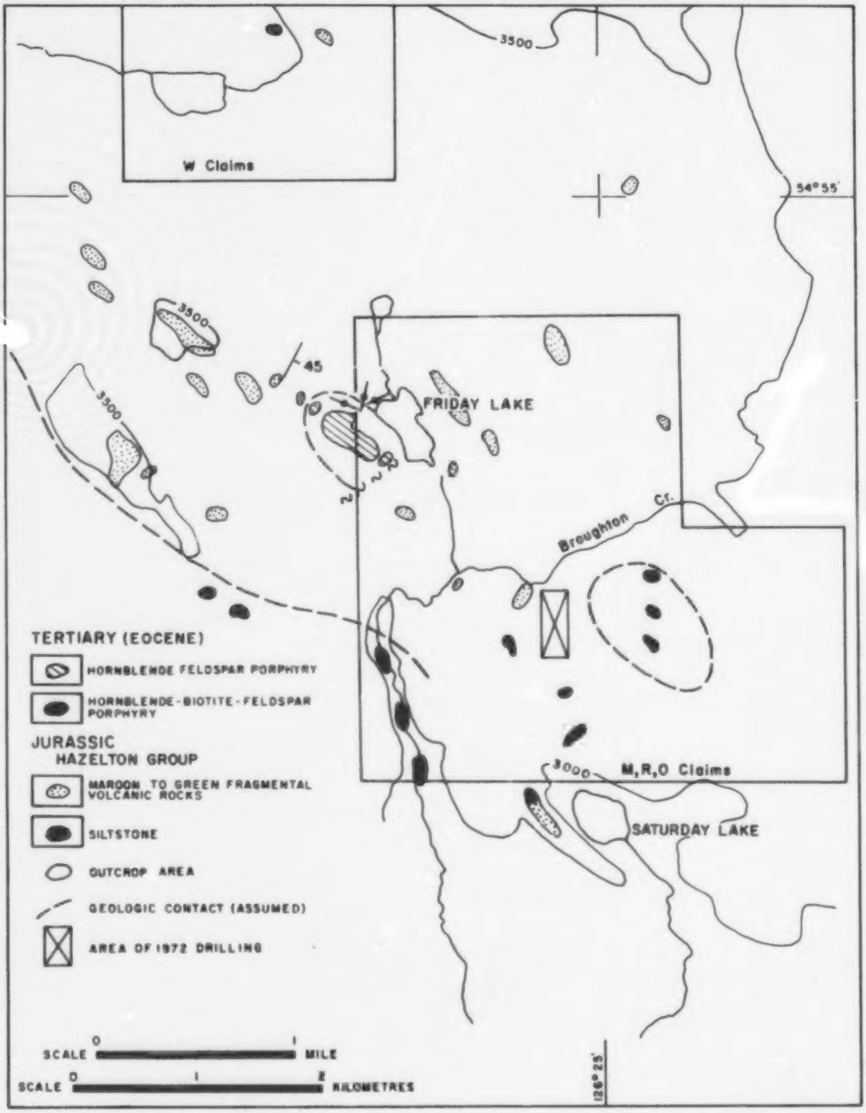

W Claims
3500
54°55'
3500
3500
45
FRIDAY LAKE
Broughton Cr.
3000
M,R,O Claims
SATURDAY LAKE
120°25'
TERTIARY (EOCENE)
HORNBLENDE FELDSPAR PORPHYRY
HORNBLENDE-BIOTITE-FELDSPAR PORPHYRY
JURASSIC
HAZELTON GROUP
MAROON TO GREEN FRAGMENTAL VOLCANIC ROCKS
SILTSTONE
OUTCROP AREA
GEOLOGIC CONTACT (ASSUMED)
AREA OF 1972 DRILLING
SCALE 0 1 MILE
SCALE 0 1 2 KILOMETRES

Figure 56. Geology in the vicinity of the M, R, O claims, Broughton Creek.

DEL, LOU (No. 96, Fig. D)

LOCATION: Lat. 54° 55′-56′ Long. 126° 15′-18′ (93L/16W)
OMINECA M.D. At approximately 2,600 feet elevation 2 miles west of Babine Lake, northwest of Granisle townsite.

CLAIMS: MINE 1 to 22.

ACCESS: By four-wheel-drive vehicle road from the Granisle Bell Copper road, 2 miles.

OWNER: W. R. Bacon.

OPERATOR: LUC SYNDICATE, 1720, 1055 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Minor copper mineralization occurs on fractures in dark green Triassic (?) volcanic rocks.

WORK DONE: Trenching, 450 feet on Mine 5 and 6.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 168; Assessment Reports 1724, 1725.

W (No. 98, Fig. D)

LOCATION: Lat. 54° 55′-56.5′ Long. 126° 27′-28.7′ (93L/16W)
OMINECA M.D. At approximately 3,400 feet elevation 4 miles northwest of Saturday Lake, 30 miles northeast of Smithers.

CLAIMS: W 1 to 35.

ACCESS: By helicopter from Smithers, 30 miles.

OWNER: AMOCO CANADA PETROLEUM COMPANY LTD., 2160, 1055 West Hastings Street, Vancouver 1.

DESCRIPTION: Hazelton Group volcanic and sedimentary rocks are overlain unconformably by nearly flat-lying hornblende feldspar porphyry flows and tuffs which are volcanic equivalents of Babine intrusive porphyries.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet and induced polarization survey, 23.78 line-miles covering W 1-35; ground magnetometer and ground electromagnetic surveys, 23.78 line-miles both covering W 6-8, 13-18, and 23-25; geochemical silt, soil, water, and rock survey, 475 samples covering W 1-35.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, Map 69-1, Geological Compilation of the Smithers, Hazelton, and Terrace Areas.

BLOW (No. 148, Fig. D)

LOCATION: Lat. 54° 50.5′ Long. 126° 01′ (93L/16E)
OMINECA M.D. At approximately 2,600 feet elevation north of Wilkinson Bay, 5 miles northeast of Topley Landing.

CLAIMS: BLOW 1 to 20.

ACCESS: By helicopter from Topley Landing, 5 miles.

OWNER: W. R. Bacon.

OPERATOR: LUC SYNDICATE, 1720, 1055 West Hastings Street, Vancouver 1.

DESCRIPTION: Topley intrusive rocks contain remnants of older sedimentary rocks.

WORK DONE: Geochemical soil survey, 265 samples covering all claims.

(93L/16E)

GRANISLE MINE (No. 194, Fig. D)

By W. G. Clarke

LOCATION: Lat. 54° 56.5′ Long. 126° 09.5′ (93L/16E)
OMINECA M.D. On McDonald (Copper) Island, 10 miles north of Topley Landing.

CLAIMS: Thirty-one Crown-granted and 15 recorded claims on McDonald Island and 44 recorded claims on Sterrett Island and one adjoining island to the south.

ACCESS: By ferry from the townsite of Granisle, on the west side of Babine Lake, 7 miles by gravel road from Topley Landing.

OWNER: GRANISLE COPPER LIMITED, 1111 West Georgia Street, Vancouver 5; mine office, Granisle.

METALS: Copper (silver, gold) (production shown on Table I).

WORK DONE:

Production expansion from 6,000 tons per day to 14,000 tons per day was completed. Two Marion 151-M shovels with 9-cubic-yard buckets, six Terex 65-ton trucks, a Caterpillar 992 loader with a 10-cubic-yard bucket, and ancillary equipment were added to the pit fleet. A tertiary crusher, a 13-foot by 18-foot rod mill, a 16.5-foot by 20-foot ball mill, and six conveyor belts were added to the crushing and grinding circuit. A 16-cell bank of Denver DR-600-H flotation cells was added and the concentrate storage building was moved from the west landing to the plantsite. The pit equipment maintenance was enlarged.

Waste rock was used for road, causeway, and tailings dam construction. Grass was planted on 16 acres of completed tailings dam.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1966, pp. 97-99; 1967, pp. 104, 105; 1968, pp. 132, 133; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, pp. 114, 115; 1970, pp. 166, 167; 1971, pp. 178-183.

TONJA, BAB (No. 99, Fig. D)

LOCATION: Lat. 54° 56.8′ - 55° 09.6′ Long. 126° 12.2′-17.0′ (93L/16E; 93M/1)
OMINECA M.D. Between 2,300 and 3,500 feet elevation on Hatchery Arm and Hawthorn Bay, Babine Lake.

CLAIMS: TONJA, BAB, NED, SNO, etc., totalling approximately 650.

ACCESS: By road and boat from Smithers, 40 to 50 miles.

OPERATOR: QUINTANA MINERALS CORPORATION, 1215, 555 Burrard Street, Vancouver 1.

DESCRIPTION: The large claim holding extends along the east side of Babine Lake from Hawthorn Bay to Hatchery Arm where additional claims are situated west of the lake. Triassic, Jurassic, and Cretaceous volcanic, sedimentary, and granitic rocks are intruded by Eocene feldspar porphyry dykes. These are overlain by younger Tertiary volcanic and sedimentary rocks.

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 2,000 feet and geochemical rock and minor soil survey covering all claims.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1966, p. 92; Assessment Reports 4249, 4250.

TREK (No. 100, Fig. D)

LOCATION: Lat. 54° 57' Long. 126° 06' (93L/16E)
OMINECA M.D. At approximately 2,400 feet elevation near Hawthorn Bay, east shore of Babine Lake.

CLAIMS: HAG 1 to 64.

ACCESS: By boat from Topley Landing, 10 miles.

OWNER: CANADIAN SUPERIOR EXPLORATION LIMITED, Box 100, Smithers.

METAL: Copper.

DESCRIPTION: Diorite intrudes Hazelton volcanic rocks.

WORK DONE: Induced polarization survey, 10 line-miles covering Hag 1-26 and 47-49; magnetometer survey, 32 line-miles covering all claims; geochemical soil survey, 874 samples covering all claims.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1967, pp. 102, 103; Assessment Report 4189.

BELL MINE (NEWMAN) (No. 182, Fig. D)

LOCATION: Lat. 55° 00' Long. 126° 14' (93M/1E; 93L/16E)
Report on this property in section 93M/1E.

HAZELTON 93M

TONJA, BAB (No. 99, Fig. D)

LOCATION: Lat. 54° 56.8' - 55° 09.6' Long. 126° 12.2'-17.0' (93L/16E; 93M/1)
Report on this property in section 93L/16E.

BELL MINE (NEWMAN) (No. 182, Fig. D) By W. G. Clarke

LOCATION: Lat. 55° 00.3' Long. 126° 13.7' (93M/1E; 93L/16E)
OMINECA M.D. On the north end of Newman Peninsula, on Babine Lake.

CLAIMS: NEWMAN, LINDA, LAD, etc., totalling 181.

ACCESS: From Highway 16 by gravel road via Topley Landing, 42 miles to a landing on the west shore of Babine Lake, 8 miles north of Granisle, then by barge to Newman Peninsula.

OWNER: NORANDA MINES, LIMITED (Bell Copper Division), Box 2000, Granisle.

METALS: Copper (gold) (production shown on Table I).

DESCRIPTION: Copper mineralization is associated with a stock-like body of feldspar porphyry which intrudes sedimentary and fragmental volcanic rocks near the northern end of a regional synclinal structure on Newman Peninsula. Some offsetting of the sedimentary and volcanic sequence has occurred along two parallel fault zones which trend northwestward across the property.

WORK DONE:

Mining operations commenced in February 1972 and continued for the remainder of the year on a two-shift-per-day, five-day-per-week basis.

The open pit is designed on the basis of 40-foot benches and a 45-degree final wall slope. Ultimate pit depth will be about 860 feet. Blast holes 9 7/8 inches in diameter are drilled in both ore and waste, using an electric rotary drill and tricone bits. All holes are drilled to allow for 7 feet of subgrade. AN/FO mixture accounted for approximately 90 per cent of blasting agents used during the year. The powder factor averaged 0.45 pound per ton. The broken material is loaded by 7-cubic-yard electric shovels into 65-ton diesel-powered trucks for haulage out of the open pit.

Mining equipment utilized during 1972 included one B.E. 45-R rotary drill, one G.D. ATC-3100 airtrac drill with 600-cubic-foot-per-minute compressor, one AN/FO truck, two P&H 1600 electric shovels equipped with 7-cubic-yard buckets, one Caterpillar 992 front-end loader with 10-cubic-yard bucket, one B.E. 88-B diesel shovel with 4-cubic-yard bucket, ten Terex R-65 trucks, two Caterpillar D-8H tractors, one Caterpillar 824 rubber-tired bulldozer, one Caterpillar 14-E motor grader, one Champion D-600B motor grader, one 1800 International with a 1,500-gallon water tank, one Autocar tractor for hauling a road-sanding unit, and miscellaneous service vehicles.

Some 1,890,000 tons of waste material extracted from the open pit was used for construction of tailings dams. Of this total 1,560,000 tons were placed on No. 1 and No. 6 tailings dams while 330,000 tons was used for construction of access roads to the dams.

Ore hauled from the pit in the 65-ton-capacity mine trucks is crushed to minus 6 inches in a 42-65 gyratory crusher. Crusher product is screened and the plus ¾-inch material is conveyed to a 20,000-ton coarse ore stockpile. The minus ¾-inch material is conveyed directly to the fine ore bins.

The coarse ore from the stockpile is reclaimed and crushed in a conventional two-stage closed-circuit crushing plant using 7-foot crushers. This product, at minus ¾ inch, is conveyed to the fine ore bins.

The mill consists of two parallel 5,000-ton-per-day circuits. Each circuit consists of one 13-foot diameter by 18-foot long rod mill and one 13.5-foot diameter by 28-foot long ball mill closed with cyclone-type classifiers. A satisfactory mineral liberation is achieved with a grind of 70 per cent minus 200 mesh. The fine product from the cyclones flows to a bank of thirteen 300-cubic-foot flotation cells which remove the copper minerals from the ore in the form of a low-grade rougher concentrate. The residue from these flotation cells is the tailings.

The rougher concentrate from both circuits is combined and reground in a small 9-foot diameter by 14-foot ball mill and refloated in three stages of cleaner flotation to produce a high-grade saleable copper concentrate.

The copper concentrate is thickened, filtered, dried, and trucked to Topley for loading into railraod cars for shipment to the smelter.

The first ore was delivered to the concentrator in October 1972 and some 767,270 tons was treated by year end. Concentrator throughout averaged 9,200 tons per day during that period.

Electrical and mechanical installation of all process equipment was completed during the year. Major equipment installed included one Allis Chalmers 42-65 gyratory crusher, one Link Belt 60-inch-wide apron feeder, one Nordberg 7-foot standard cone crusher, two Nordberg 7-foot short-head cone crushers, three Allis Chalmers 8-foot by 20-foot double deck screens, two Dominion 13-foot diameter by 18-foot long rod mills, two Dominion 13.5-foot diameter by 28-foot long ball mills, one Allis Chalmers 9-foot diameter by 14-foot long regrind mill, two Kreb primary cyclone assemblies, one Kreg regrind cyclone assembly, two banks of thirteen Galligher rougher flotation cells, two banks of twelve Denver first cleaner flotation cells, two banks of twelve Denver second and third cleaner flotation cells, one Dorr Oliver 60-foot diameter thickener, one Eimco 8-foot 10-inch diameter eight-disc agidisc filter, one Bingham vacuum pump, one Ruggles-Coles 70-inch diameter by 40-foot long direct-fired dryer, twenty-one conveyors of varying lengths and widths, six dust-collection systems, and miscellaneous process pumps.

Eighty single family houses and 44 bachelor apartments at Granisle townsite were occupied or near completion by year end.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1965, pp. 99-102; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 114; 1970, p. 170; 1971, p. 185.

OFF, RAID, DDT (No. 110, Fig. D)

LOCATION: Lat. 55° 04.5′ Long. 126° 20.2′ (93M/1W)
OMINECA M.D. At approximately 2,500 feet elevation on the southeast slope of Old Fort Mountain, 40 miles northeast of Smithers.

CLAIMS: OFF 1 to 8, 15 to 18, RAID 1 to 14, DDT 5 to 14, 19 to 40.

ACCESS: By boat from Smithers Landing, 10 miles.

OWNER: WESFROB MINES LIMITED, 500, 1112 West Pender Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: Chalcopyrite and some molybdenite occur in fractures in a biotite feldspar porphyry which intrudes a stock of fine-grained quartz diorite. Marginal to this stock, argillaceous siltstones are hornfelsed and pyritized. Trenching in 1972 was carried out east of the stock in order to check induced polarization anomalies. Trenching exposed intensely fractured hornfels.

WORK DONE: Trenching, 2,580 feet on Off 5-8 and DDT 12 and 14.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1966, pp. 92-95; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 186.

WASP (No. 15, Fig. D)

LOCATION: Lat. 55° 03.5′ Long. 126° 40′ (93M/2E)
OMINECA M.D. At approximately 3,000 feet elevation 5 miles west of Smithers Landing.

CLAIMS: KATE, totalling 110.

(93L/15W; 93M/2W)

ACCESS: By road from Smithers, approximately 50 miles.

OPERATOR: SELCO MINING CORPORATION LIMITED, 6th Floor, 55 Yonge Street, Toronto, Ont.

METAL: Copper.

DESCRIPTION: A few outcrops and scattered float of biotite feldspar porphyry typical of the Babine area porphyry copper deposits are found on the claims.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; induced polarization survey and magnetometer survey, approximately 10 line-miles each covering Kate 1-24; surface diamond drilling, five holes totalling 1,200 feet on Kate 2, 3, and 4.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1968, p. 132; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 187; Assessment Reports 3647, 3869.

A (No. 132, Fig. D)

LOCATION: Lat. 54° 59' - 55° 01' Long. 126° 45.5'-47'
(93L/15W; 93M/2W)

Report on this property in section 93L/15W.

BRUNSWICK (No. 170, Fig. D)

LOCATION: Lat. 55° 07.7' Long. 127° 35.8' (93M/4E)
OMINECA M.D. Between 4,500 and 4,650 feet elevation on Red Rose Creek, Rocher Deboule Range, 10 miles south of Hazelton.

CLAIMS: BILL 1 to 14.

ACCESS: By four-wheel-drive vehicle road from Highway 16, 12 miles.

OPERATOR: ARCADIA EXPLORATIONS LTD., Box 35368, Station E, 2021 West 42nd Avenue, Vancouver 13.

METALS: Silver, lead, zinc.

DESCRIPTION: The vein system consists of vuggy quartz, silicified wallrock, carbonate, and sulphide minerals. These include concentrations of pyrite, galena, sphalerite, chalcopyrite, and tetrahedrite.

WORK DONE: Six miles of road reconstructed; stripping, 200 square feet on Bill 2; 132 feet of underground work; rotary drilling, two holes totalling 25 feet on Bill 2.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1952, p. 93; *B.C. Dept. of Mines & Pet. Res.,* Bull. 43, 1960, pp. 50, 51.

HOT, HAZ (No. 47, Fig. D)

LOCATION: Lat. 55° 12.4' Long. 127° 33.7' (93M/4E)
OMINECA M.D. On Station Creek near Hagwilget Peak, 2 miles south of New Hazelton.

CLAIMS: HOT 1 to 8, HAZ 1, 3, 5, 7 to 14.

ACCESS: By road from New Hazelton.

OWNER: J. H. SARGENT, Box 39, New Hazelton.

WORK DONE: Line-cutting.

REFERENCE: Assessment Report 3872.

LOUDEL (CAP, GOLDEN WONDER) (No. 196, Fig. D)

LOCATION: Lat. 55° 09'-12' Long. 127° 39'-45' (93M/4W)
OMINECA M.D. On the west slope of Rocher Deboule Mountain, 6.5 miles southwest of New Hazelton.

CLAIMS: Mineral Leases M-79 (GOLDEN WONDER), M-80 (HOMESTAKE, RED CROSS, PATRIOTIC, MONOPLANE, MASCOT, LITTLE HELEN, COPPER HILL, SKEENA), M-90 (HUCKLEBERRY), and M-91 (MANDON) and LOUDEL 1 to 7, 7A, 14 to 19, 24 to 30, 33 to 35, 46, 57 to 68, CHAP 1 to 8, 21 to 23.

ACCESS: By Highway 16 from New Hazelton, approximately 9 miles.

OWNER: CHAPPARAL MINES LTD., 328, 470 Granville Street, Vancouver 2.

METALS: Copper, tungsten, silver, gold.

DESCRIPTION: On the Mandon Crown grant, quartz feldspar porphyry dykes intrude arenaceous and pelitic sedimentary rocks. Chalcopyrite-bearing quartz veins occur within and along dyke walls and disseminations in greywacke. A pyritic halo is apparent. On the Huckleberry Crown grant, pyritic, altered meta-andesite locally contains chalcopyrite-quartz stringers and disseminations.

WORK DONE: Surface workings mapped; surface diamond drilling, one hole totalling 927 feet on Loudel 16.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 189; Bull. 43, 1960, pp. 51, 52.

SUNRISE (No. 151, Fig. D)

LOCATION: Lat. 55° 20.8' Long. 127° 28.5' (93M/6W)
OMINECA M.D. Between 4,700 and 5,200 feet elevation on the north side of Nine Mile Mountain, 10 miles northeast of Hazelton.

CLAIMS: SUNRISE, SUNSET, ETHEL, NOONDAY, ETHEL Fraction, HIDDEN TREASURE Crown-granted claims and ALPHA 1 to 30, VAN 31 to 36.

ACCESS: By road from Hazelton, 13 miles.

OWNER: SUNRISE SILVER MINES LTD., 818 Cumberland Crescent, North Vancouver.

METALS: Silver, lead, zinc, antimony.

DESCRIPTION: The deposits occur in veins along intersecting fault fissures in granodiorite. The vein structures are exposed over a 700-foot width from north to south and extend 2,500 feet in length.

WORK DONE: Road construction, one-half mile (north side of Nine Mile Mountain); stripping.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 189.

HOT (No. 133, Fig. D)

LOCATION: Lat. 55° 24.3′ Long. 127° 02.0′ (93M/6E)
OMINECA M.D. At approximately 6,000 feet elevation on the north slope of Mount Thoen, about 50 miles north of Smithers.

CLAIMS: HOT 1 to 26.

ACCESS: By helicopter from Smithers, 50 miles.

OWNER: COBRE EXPLORATION LIMITED, 1400, 1030 West Georgia Street, Vancouver 5.

METALS: Copper, molybdenum.

DESCRIPTION: Argillite and quartzite of the Bowser Assemblage are hornfelsed, fractured, and pyritized along the east contact of a large quartz diorite stock. Chalcopyrite, molybdenite, and minor bornite occur in the hornfelsed sedimentary rocks and in quartz-biotite feldspar porphyry dykes near the contact of the stock.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet covering Hot 3-10; petrographic study, 25 samples; geochemical rock-chip survey, 63 samples covering Hot 2, 4, 6, 8, and 10.

REFERENCE: Assessment Report 3970.

DAISY (No. 134, Fig. D)

LOCATION: Lat. 55° 17.8′ Long. 126° 59.3′ (93M/6E, 7W)
OMINECA M.D. At elevations of 3,000 to 4,000 feet on Netalzul Mountain, 25 miles east of Hazelton.

CLAIMS: DAISY 1 to 38.

ACCESS: By helicopter from Smithers, 33 miles.

OWNER: Twin Peak Resources Ltd.

OPERATORS: TWIN PEAK RESOURCES LTD., Box 604, Smithers and SELCO MINING CORPORATION LIMITED, 6th Floor, 55 Yonge Street, Toronto, Ont.

METALS: Copper, molybdenum.

DESCRIPTION: Pyrite, molybdenite, and chalcopyrite occur in disseminations and in quartz veinlets in quartz monzonite.

WORK DONE: Geological survey.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 187; Assessment Report 3969.

RO (No. 48, Fig. D)

LOCATION: Lat. 55° 24′-27′ Long. 126° 48′-54′ (93M/7W)
OMINECA M.D. At approximately 5,000 feet elevation 5 miles north of French Peak and 50 miles north-northwest of Smithers.

CLAIMS: RO 1 to 66.

ACCESS: By helicopter from Smithers, 50 miles.

OWNER: CANADIAN SUPERIOR EXPLORATION LIMITED, 2201, 1177 West Hastings Street, Vancouver 1.

DESCRIPTION: Biotite feldspar porphyry intrudes Hazelton Group volcanic rocks.

WORK DONE: Induced polarization and magnetometer surveys, 20 line-miles covering RO 13, 14, 23-30, 34, 42, 45, and 47-53.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 190, 191; Assessment Report 3871.

LYNN (No. 118, Fig. D)

LOCATION: Lat. 55° 18′ Long. 126° 13′ (93M/8E)
OMINECA M.D. At approximately 4,000 feet elevation 4 miles north of the south end of Nakinilerak Lake, 54 miles northeast of Smithers.

CLAIMS: LYNN 1 to 48, 1 to 18 Fractions.

ACCESS: By helicopter from Smithers, 54 miles.

OWNERS: Ducanex Resources Limited and Twin Peak Resources Ltd.

OPERATOR: DUCANEX RESOURCES LIMITED, 3701 Royal Trust Tower, Box 354, Toronto-Dominion Centre, Toronto, Ont.

METAL: Copper.

DESCRIPTION: Pyrite, magnetite, and chalcopyrite occur in a typically altered and leached biotite feldspar porphyry. The intrusive is entirely covered with drift, and may be in the form of a northerly trending dyke swarm.

WORK DONE: Surface diamond drilling, three holes totalling 580 feet on Lynn 3 and 4.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 192; Assessment Report 3531.

FRIDAY (No. 16, Fig. D)

LOCATION: Lat. 55° 19.7′-20.7′ Long. 126° 09′-14′ (93M/8E)
OMINECA M.D. At approximately 3,000 feet elevation on Sinta Creek, 5 miles east of Friday Lake, 45 miles northeast of Smithers.

CLAIMS: FRIDAY 1 to 46, 1 to 9 Fractions (David Minerals Ltd.); FRIDAY 1 to 15, 1 to 6 Fractions (Ducanex Resources Limited and Twin Peak Resources Ltd.).

ACCESS: By helicopter from Smithers, approximately 45 miles.

OWNERS: David Minerals Ltd., Ducanex Resources Limited, and Twin Peak Resources Ltd.

OPERATORS: CALIENTE MINING CORPORATION, 1101, 510 West Hastings Street, Vancouver 2 and DUCANEX RESOURCES LIMITED, 3701, Royal Trust Tower, Box 354, Toronto-Dominion Centre, Toronto, Ont.

WORK DONE: Caliente Mining Corporation conducted magnetometer and geochemical surveys covering Friday 1-46 and 1-9 Fractions; Ducanex Resources Limited conducted the following surveys: surface geological mapping, 1 inch equals 400 feet covering Friday 1-4; induced polarization survey, 10 line-miles and magnetometer survey, 7 line-miles covering Friday 1-15 and 1-6 Fractions.

REFERENCES: Assessment Reports 2682, 3878.

BRIAN, ADD (No. 49, Fig. D)

LOCATION: Lat. 55° 38.8' Long. 126° 49.5' (93M/10W)
OMINECA M.D. At approximately 5,000 feet elevation on Mount Horetzky, 40 miles northeast of Hazelton.

CLAIMS: BRIAN 1 to 10, 19 to 24, ADD 1 to 18, 23 to 28, VAL 3 to 8, 11 to 16.

ACCESS: By helicopter from Smithers, 70 miles.

OWNERS: Earl Dodson and A. J. MacDonald.

OPERATORS: PACIFIC PETROLEUMS LIMITED, 408, 580 Granville Street, Vancouver 2 and HECLA OPERATING COMPANY, 2009, 1177 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: Argillaceous sedimentary rocks are intruded and hornfelsed by a fine-grained magnetic quartz diorite stock. The stock and hornfels are intruded by dykes of biotite feldspar porphyry. Chalcopyrite, pyrite, and molybdenite occur in fractures in the quartz diorite and hornfels adjacent to porphyry dykes.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Add 1-4, 6-17, 23-28, Brian 1-10, 19-24, and Val 3-8, 11-16; induced polarization survey, 9.5 line-miles covering Add 1-4, 7, 15, 16, 23, 25-28, Brian 1-9, 19-24, and Val 3, 5-8, 11, 13-16; magnetometer survey, 22.1 line-miles covering all claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 194; Assessment Reports 3870, 3967.

7A (No. 82, Fig. D)

LOCATION: Lat. 55° 33.5' Long. 127° 19.5' (93M/11W)
OMINECA M.D. Between 2,200 and 4,800 feet elevation on Thomlinson Creek, 24 miles northeast of Hazelton.

CLAIMS: 7A 1 to 58, 7D 1 to 12.

ACCESS: By helicopter from Hazelton, 24 miles.

OWNER: THE GRANBY MINING COMPANY LIMITED, 2000, 1055 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: Small amounts of chalcopyrite and molybdenite occur in fractures in a small quartz monzonite intrusive cutting Bowser sedimentary rocks.

WORK DONE: Geochemical soil survey, 97 samples covering 7A 36, 38, 40, 45-50 and 7D 6-8.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 195; Assessment Report 3968.

CARR (No. 34, Fig. D)

LOCATION: Lat. 55° 52' Long. 126° 04' (93M/16E)
OMINECA M.D. At approximately 5,000 feet elevation at the north end of Takla Lake, 13 miles north-northeast of Bulkley House.
CLAIMS: CARR 1 to 16.
ACCESS: By helicopter from Smithers, 95 miles.
OWNER: CANADIAN SUPERIOR EXPLORATION LIMITED, Box 100, Smithers.
METALS: Copper, molybdenum.
DESCRIPTION: A monzonite-diorite stock related to the Omineca Intrusions cut Lower Jurassic volcanic rocks.
WORK DONE: Magnetometer survey, 6 line-miles and geochemical soil survey, 192 samples covering Carr 1-7 and 12-16.
REFERENCE: Assessment Report 3769.

MANSON RIVER 93N

OUI (No. 80, Fig. D)

LOCATION: Lat. 55° 05'-06.6' Long. 124° 24'-26' (93N/1W)
OMINECA M.D. Three miles south of the east end of Witch Lake, 4 miles west of Wittsichica Creek.
CLAIMS: OUI 1 to 40.
ACCESS: By helicopter from Fort St. James, 45 miles.
OWNER: PECHINEY DEVELOPMENT LIMITED, 701, 744 West Hastings Street, Vancouver 1.
DESCRIPTION: Volcanic rocks of the Takla Group consist mainly of andesite and basalt.
WORK DONE: Surface geological mapping, 1 inch equals 500 feet; ground magnetometer survey, 25 line-miles; geochemical soil survey, 360 samples covering all claims.

EVE (No. 3, Fig. D)

LOCATION: Lat. 55° 10.2' Long. 124° 29' (93N/1W)
OMINECA M.D. South of Chuchi Lake, 7 miles east of the mouth of Jean Marie Creek, 70 miles north of Fort St. James.
CLAIMS: EVE 1 to 8.
ACCESS: By helicopter from Fort St. James, 70 miles.
OWNER: CANWEX EXPLORATIONS LTD., 1666 West Broadway, Vancouver 9.
WORK DONE: Geochemical soil survey during 1971.
REFERENCE: Assessment Report 3468.

A (No. 122, Fig. D)

LOCATION: Lat. 55° 11.5'-12' Long. 124° 25'-29' (93N/1W)
OMINECA M.D. On the north shore of Chuchi Lake, 1 mile west of its junction with the Nation River.
CLAIMS: A 1 to 50.
ACCESS: By boat or floatplane from the Nation River Bridge, 5 miles.
OWNER: AMBER RESOURCES LTD., 1155, 555 Burrard Street, Vancouver 1.
WORK DONE: Reconnaissance geochemical survey; some trenching.

MT (No. 50, Fig. D)

LOCATION: Lat. 55° 09.4'-11' Long. 124° 28.8'-32.4' (93N/1W, 2E)
OMINECA M.D. Immediately south of Chuchi Lake, 1 mile north of Witch Lake.
CLAIMS: MT 1 to 40.
ACCESS: By floatplane from Fort St. James, 50 miles.
OWNER: ATTILA RESOURCES LIMITED, 107, 325 Howe Street, Vancouver 1.
WORK DONE: Prospecting; geological mapping, 1 inch equals 400 feet; line-cutting; magnetometer survey; geochemical survey.
REFERENCES: Assessment Reports 3851, 3852.

D (No. 79, Fig. D)

LOCATION: Lat. 55° 10'-12' Long. 124° 42'-44' (93N/2E)
OMINECA M.D. On the south shore of Chuchi Lake, at its western end.
CLAIMS: D, totalling 50.
ACCESS: By boat or floatplane from the Nation River bridge.
OWNER: WHITE RIVER MINES LTD., 1155, 555 Burrard Street, Vancouver 1.
WORK DONE: Reconnaissance geochemical survey; some trenching.

D (No. 79, Fig. D)

LOCATION: Lat. 55° 10.5' Long. 124° 42' (93N/2E)
OMINECA M.D. On the south side of Chuchi Lake, 1.5 miles west of Jean Marie Creek, at 3,000 feet elevation.
CLAIMS: D 187 to 198.
ACCESS: By floatplane from Fort St. James, 50 miles.
OWNER: ATTILA RESOURCES LIMITED, 107, 325 Howe Street, Vancouver 1.
WORK DONE: Prospecting; geological mapping; geochemical survey.
REFERENCES: Assessment Reports 3851, 3852.

PU (No. 52, Fig. D)

LOCATION: Lat. 55° 08.3' Long. 124° 31.8' (93N/2E)
OMINECA M.D. North of Witch Lake, 2 miles west of the east end of the lake.

(93N/2)

CLAIMS: PU 1 to 24.

ACCESS: By floatplane from Fort St. James, 50 miles.

OWNER: PECHINEY DEVELOPMENT LIMITED, 701, 744 West Hastings Street, Vancouver 1.

DESCRIPTION: Volcanic rocks of the Takla Group, mainly andesite and andesitic tuff, are intruded by small masses of dioritic and syenitic porphyry.

WORK DONE: Surface geological mapping, 1 inch equals 500 feet; ground magnetometer survey, 11 line-miles; geochemical soil survey, 330 samples covering all claims.

REFERENCE: Assessment Report 3853.

COL (No. 108, Fig. D)

LOCATION: Lat. 55° 14.7' Long. 124° 45.5' (93N/2)
OMINECA M.D. Between 3,500 and 4,000 feet elevation 3 miles north of the west end of Chuchi Lake.

CLAIMS: COL 1 to 60.

ACCESS: By road and boat from Fort St. James, 100 miles.

OPERATOR: FALCONBRIDGE NICKEL MINES LIMITED, 500, 1112 West Pender Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Bornite and chalcopyrite filling fractures in zones within a monzonitic host cut by numerous syenite dykes.

WORK DONE: Surface diamond drilling, six holes totalling 2,506 feet on Col 42, 44, and 48.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 197.

LSD (No. 56, Fig. D)

LOCATION: Lat. 55° 15.2' Long. 124° 35.5' (93N/2E, 7E)
OMINECA M.D. Between 4,000 and 6,100 feet elevation 5 miles north of the central part of Chuchi Lake.

CLAIMS: LSD, totalling 76.

ACCESS: By helicopter from Germansen Landing, 40 miles.

OWNER: HUDSON BAY EXPLORATION & DEVELOPMENT CO. LTD., 1695, 555 Burrard Street, Vancouver 1.

METALS: Copper, molybdenum.

WORK DONE: Reconnaissance geological mapping, 1 inch equals 400 feet; induced polarization survey, 6.8 line-miles covering LSD 1-4, 7-10, 60, 62-70; Geochemical soil survey, 383 samples covering LSD 23, 24, 55-70.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 196; Assessment Reports 3862, 3863.

JW, JEAN (No. 62, Fig. D)

LOCATION: Lat. 55° 04'-07.5' Long. 124° 47'-56' (93N/2W)
OMINECA M.D. Between 4,000 and 4,300 feet elevation at the head

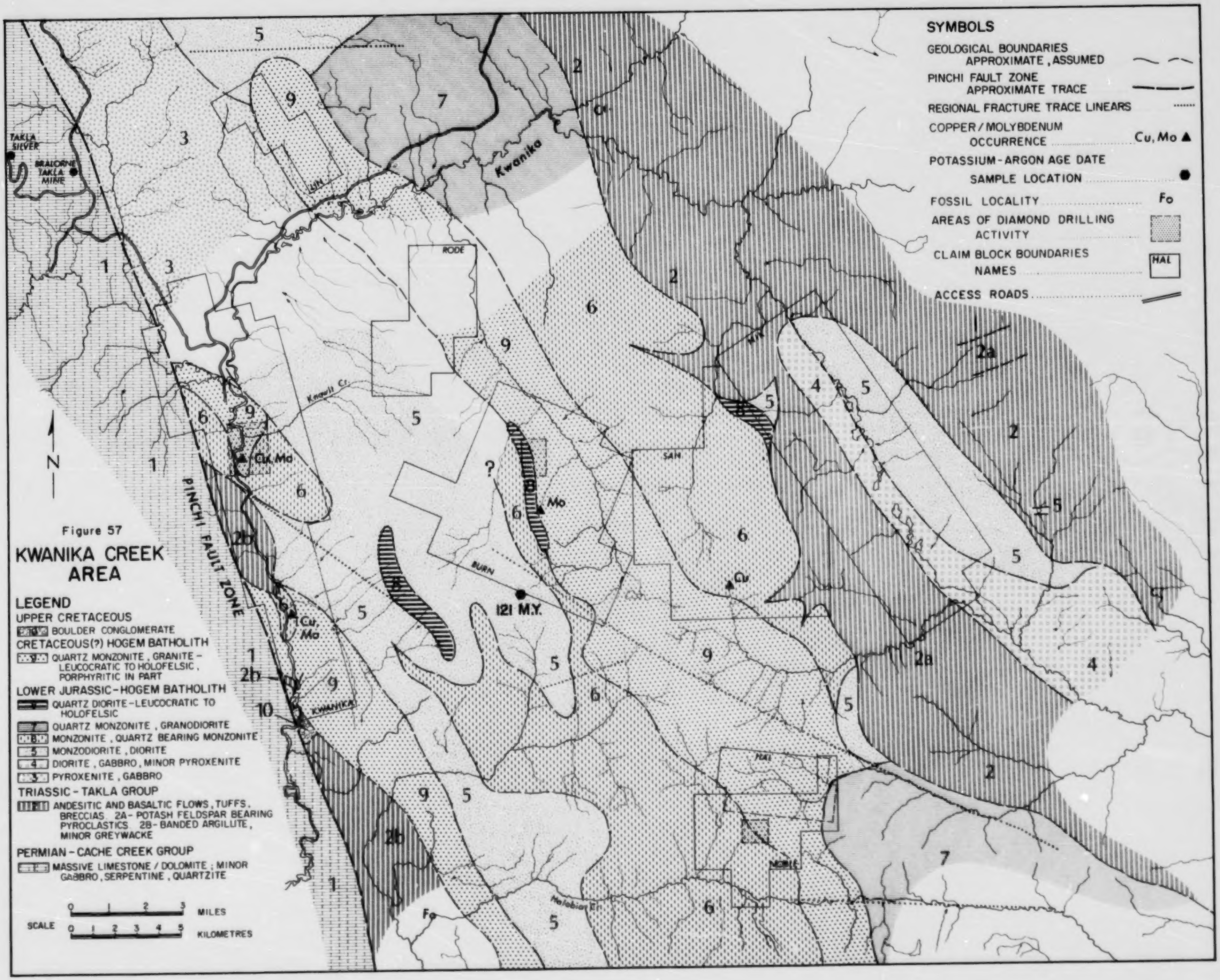


Figure 57

KWANIKA CREEK AREA

LEGEND
UPPER CRETACEOUS
10 BOULDER CONGLOMERATE
CRETACEOUS(?) HOGEM BATHOLITH
9 QUARTZ MONZONITE, GRANITE – LEUCOCRATIC TO HOLOFELSIC, PORPHYRITIC IN PART
LOWER JURASSIC – HOGEM BATHOLITH
8 QUARTZ DIORITE – LEUCOCRATIC TO HOLOFELSIC
7 QUARTZ MONZONITE, GRANODIORITE
6 MONZONITE, QUARTZ BEARING MONZONITE
5 MONZODIORITE, DIORITE
4 DIORITE, GABBRO, MINOR PYROXENITE
3 PYROXENITE, GABBRO
TRIASSIC – TAKLA GROUP
2 ANDESITIC AND BASALTIC FLOWS, TUFFS, BRECCIAS. 2A – POTASH FELDSPAR BEARING PYROCLASTICS. 2B – BANDED ARGILLITE, MINOR GREYWACKE
PERMIAN – CACHE CREEK GROUP
1 MASSIVE LIMESTONE / DOLOMITE; MINOR GABBRO, SERPENTINE, QUARTZITE
SCALE
0 1 2 3 MILES
0 1 2 3 4 5 KILOMETRES
SYMBOLS
GEOLOGICAL BOUNDARIES APPROXIMATE, ASSUMED
PINCHI FAULT ZONE APPROXIMATE TRACE
REGIONAL FRACTURE TRACE LINEARS
COPPER / MOLYBDENUM OCCURRENCE Cu, Mo ▲
POTASSIUM-ARGON AGE DATE SAMPLE LOCATION ●
FOSSIL LOCALITY Fo
AREAS OF DIAMOND DRILLING ACTIVITY
CLAIM BLOCK BOUNDARIES NAMES HAL
ACCESS ROADS
N
PINCHI FAULT ZONE
TAKLA SILVER
BRALORNE TAKLA MINE
Kwanika Cr.
Knewli Cr.
Holobias Cr.
LYN
RODE
NIK
SAN
BURN
HAL
NOBLE
KWANIKA
Cu, Mo
Cu, Mo
Mo
Cu
121 M.Y.
Fo
?
1
2
2a
2b
3
4
5
6
7
9
10

(93N/4W)

of Jean Marie Creek, 8 miles south of the eastern part of Tchentlo Lake.

CLAIMS: JW, JEAN, FEB, totalling 276.

ACCESS: By helicopter from Fort St. James, approximately 55 miles.

OWNER: W. R. Bacon.

OPERATOR: NBC SYNDICATE, 1720, 1055 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum.

WORK DONE: Induced polarization and resistivity survey coverng 12 line-miles.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 178; 1971, p. 198; Assessment Report 3899.

NALCUS (No. 124, Fig. D)

LOCATION: Lat. 55° 14′ Long. 125° 50′ (93N/4W)
OMINECA M.D. At approximately 6,000 feet elevation on the south slope of Mount Blanchet, 2 miles north of the northwest arm of Takla Lake.

CLAIMS: NALCUS 1 to 6.

ACCESS: By helicopter from Takla Landing, 15 miles.

OWNER: WESFROB MINES LIMITED, 500, 1112 West Pender Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: Copper and molybednum geochemical anomalies are present in Takla volcanic rocks.

WORK DONE: Trenching.

ND (No. 70, Fig. D)

LOCATION: Lat. 55° 23.2′-25.3′ Long. 125° 45′-47.5′ (93N/5W)
OMINECA M.D. At approximately 3,500 feet elevation on the east shore of Takla Lake, south of Tliti Creek, 5 miles west of Klowkut Peak.

CLAIMS: ND 1 to 26.

ACCESS: By helicopter from Fort St. James, 90 miles.

OWNER: NITHEX EXPLORATION AND DEVELOPMENT LTD., Box 73, Endako.

WORK DONE: Geochemical soil survey, 35 samples covering all claims.

KWANIKA CREEK AREA

By J. A. Garnett

INTRODUCTION: The map-area is in the centre of the Kwanika Mountains, part of the Swannell Ranges, a subdivision of the Omineca Mountains. Rocks of the Hogem batholith are exposed along the high ridges of these ranges at elevations between 6,000 and 6,200 feet. To the west, Kwanika Creek and Nation River flow southward into the Nation Lakes chain through a broad drift-covered valley which contains the trace of the Pinchi Fault Zone. Elevations at river level are approximately 3,000 to 3,200 feet. A good four-wheel-drive vehicle road traverses the northern portion of the map-area from east to west, running from Manson Creek, past Germansen Lake, to Takla Landing.

Exploration activity during the 1972 field season was directed mainly towards evaluation of properties acquired in areas within the batholith where previous reconnaissance surveys had indicated regionally anomalous copper and molybdenum geochemical results. Approximate location of claims are plotted on Figure 57, along with preliminary results of regional mapping done by the writer, J. P. Franzen, and D. V. Lefebure.

GEOLOGY: The major geologic features of this area include the various rock units of the Hogem batholith, which intrude Takla Group rocks; the Cache Creek Group metasedimentary strata to the west; and the Pinchi Fault Zone, a pronounced northwest-trending regional lineament that separates these major geologic units.

Geographic distribution of the major units of the Hogem batholith in this area is illustrated on Figure 57. Petrographic distribution is recorded on Figure 58, a plot of normalized proportions of quartz-potash feldspar-plagioclase representing modal estimates of 217 stained slabs of specimens uniformly distributed over the map-area. Areas mapped as gabbro-pyroxenite (unit 3) were not plotted on Figure 58.

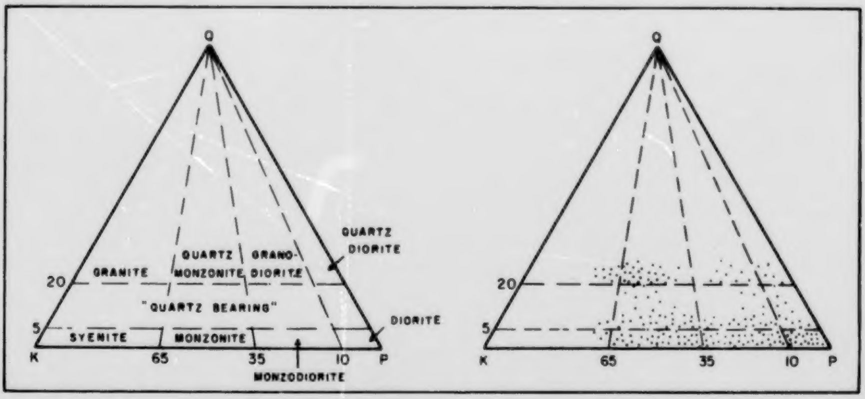


Figure 58. Field classification of plutonic rocks and corresponding modal estimates of 217 stained slabs from Hogem batholith, Kwanika Creek area.

Units 3 to 8 show gradational contacts and are interpreted as representing differentiated units within the batholith. Unit 9 clearly intrudes these more basic rocks. Aeromagnetic contours are very useful in distinguishing certain phases, with units 3 and 4 showing up as distinct highs and unit 9 showing up as distinct lows.

A K-Ar date from fresh secondary phlogopite within unit 5 gave an age of 121±4 m.y.* Dating elsewhere within the batholith has indicated significantly older dates for similar basic to intermediate units of the Hogem, and a preliminary interpretation is that this date represents a resetting due to the nearby intrusion of unit 9.

Along the eastern margin of the batholith in this area, unit 5 dykes cut green, grey-green, and black, mainly porphyritic pyroxene andesites and basalts (unit 2). Intense fracturing, mild hornfelsing, and local pyritization represent further evidence of Hogem intrusion into these volcanic rocks identified as Takla Group (Armstrong, 1949).

Along the western margin of the map-area, the intruded Takla Group rocks are mainly metasedimentary, and occur as wedges between the batholith margin and the Pinchi Fault Zone (unit 2b).

Interbanded, thinly bedded black argillite and brown siltstone cut by intrusive dykes crop out along Kwanika Creek and exhibit slaty cleavage parallel to the steeply dipping compositional layering. The Upper Triassic pelecypod *Halobia* has been identified in similar strata on Halobia Creek (Armstrong, 1942, 1944).

The Pinchi Fault Zone is the main structural feature of this region, and separates Permian rocks (Cache Creek Group) on the southwest from Mesozoic rocks northeast of the fault. In the map-area, the fault trace lies within a wide drift-covered valley, and outcrops close to the fault are rare. However, outcrops exposed along the banks of Kwanika Creek exhibit intense fracturing, brecciation, and numerous faults, indicating proximity to this major lineament. Investigation of these outcrops suggests that the Pinchi Fault is in fact a zone of intense brecciation and faulting which could be up to 1,000 feet wide in this area. There is clearly more than one generation of fracturing present, demonstrating at least two periods of movement along this zone. The regional rock distribution indicates uplift of the southwest (Permian) block relative to the northeast (Mesozoic) block. However, numerous slickensides on the minor faults investigated along Kwanika Creek exhibit mainly shallow-plunging lineations.

A red, hematite-stained, polymict boulder conglomerate (unit 10) was observed at two localities on Kwanika Creek. Well-rounded pebbles and boulders of greenish altered intermediate intrusive rock predominate. Fragments of black argillite were also noted. The conglomerate appears to overlie intrusive unit 9 in one exposed, faulted contact zone. An aligned oblate shape to the boulders defines a vertical, northerly striking foliation, suggesting that the conglomerate has been affected by late movements along the Pinchi Fault immediately west of this area. This unit was mapped previously and was considered to be Cretaceous or younger in age (Armstrong, 1944, 1949).

MINERALIZATION: The claim block outlines on Figure 57 indicate the main areas of exploration activity within the map-area. The most significant areas of mineralization occur along Kwanika Creek (copper-molybdenum), near Burn Creek (molybdenum), and in the southern part of the San group (copper-molybdenum). All are spatially associated with unit 9 intrusions into pre-existing units of the Hogem. Other claim blocks (Lin, Rode, Hal, Noble) represent areas of high geochemical response, again associated with unit 9. The Nik claims are staked along the contact of a basic outlier of the Hogem surrounded by Takla Group volcanic flows and pyroclastic rocks, where a high geochemical response is associated with a magnetic high.

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*KWANIKA -- University of British Columbia, Department of Geophysics; NTS 93N/6E; 55 degrees 29.1 minutes latitude, 125 degrees 14 minutes longitude.

REFERENCES: Armstrong, J. E. (1942), The Pinchi Lake Mercury Belt, British Columbia, *Geol. Surv., Canada,* Paper 42-11; (1944), Northern Part of the Pinchi Lake Mercury Belt, British Columbia, *Geol. Surv., Canada,* Paper 44-5; (1949), Fort St. James Map-Area, Cassiar and Coast Districts, British Columbia, *Geol. Surv., Canada,* Mem. 252.

BOOM, FRANKIE (KWANIKA) (No. 130, Fig. D)

By J. A. Garnett

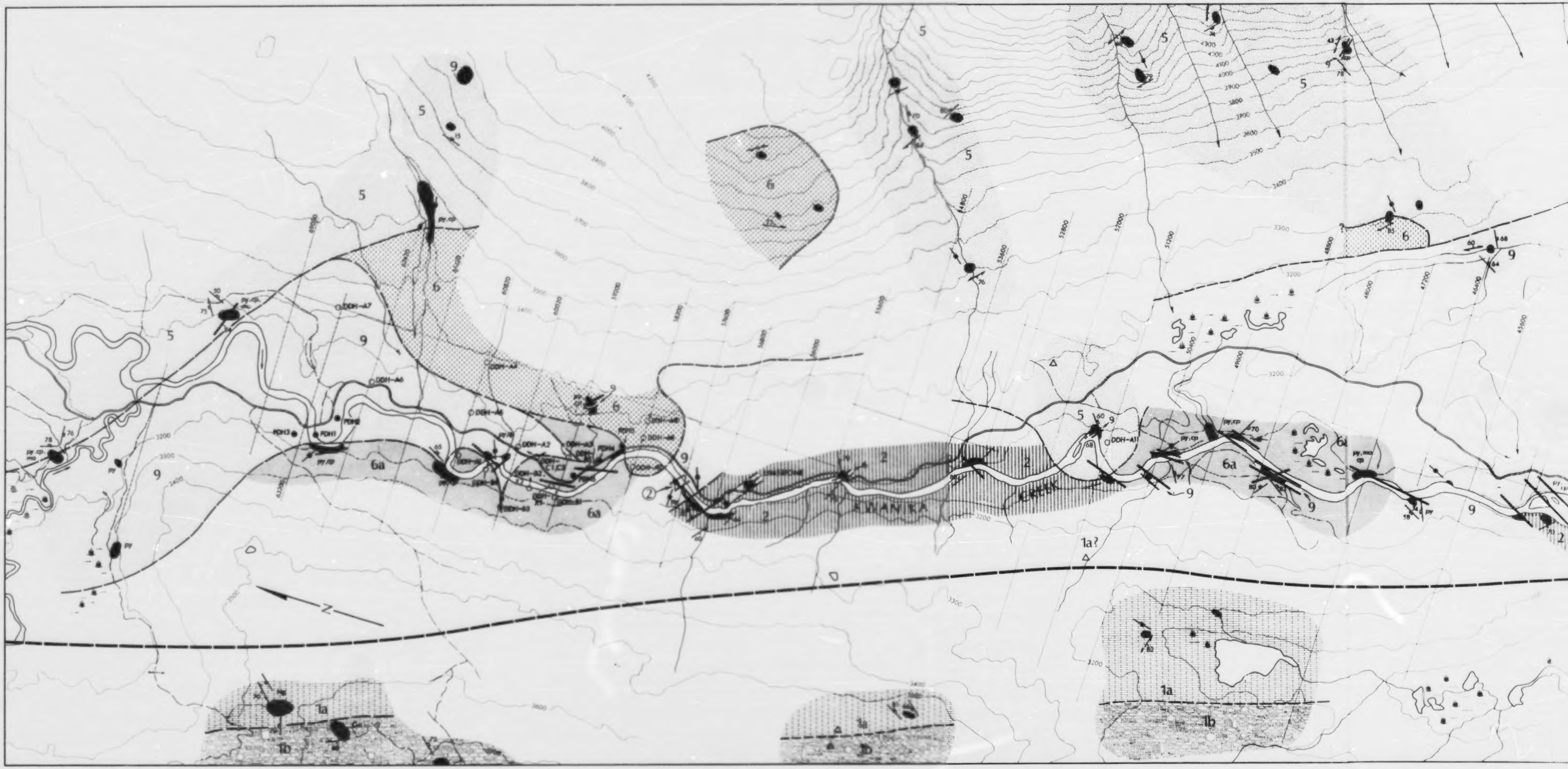
LOCATION:	Lat. 55° 28'-32.5' Long. 125° 15'-19' (93N/6W, 11W) OMINECA M.D. At approximately 3,100 feet elevation on Kwanika Creek, 4 to 8 miles north of its mouth at the east end of Tsayta Lake.
CLAIMS:	BOOM, FRANKIE, T GEE, JAM, MG, HG, CHO, OVP, BH, CU, KS, BUD, TX, MAYA, POST, KQ, totalling 120.
ACCESS:	By road from Germansen Landing, 50 miles west.
OWNER:	BOW RIVER RESOURCES LTD., 333, 885 Dunsmuir Street, Vancouver 2.
METALS:	Copper, molybdenum.

DESCRIPTION:

HISTORY: Following the discovery of mercury at Pinchi Lake in 1937, exploration northwestward along the Pinchi Lake Mercury Belt was conducted by geologists of The Consolidated Mining and Smelting Company of Canada, Limited and others. The general Kwanika Creek area is part of this belt, and was first mapped by the Geological Survey of Canada in 1941 and 1943 in conjunction with this search for mercury (Armstrong, 1942, 1944). Occurrences of mercury within the boundaries of the present property were investigated at that time and the Bralorne-Takla mercury mine, which operated during 1943-44, is located 4 miles northwest of the property along the continuation of the Pinchi Fault Zone. The Takla Silver property, first staked in the early 1940's, is located immediately west of Bralorne-Takla (Fig. 57). Placer gold in Kwanika Creek was noted in the reports available from this period, but no mention was made of pyrite-chalcopyrite mineralization.

The rusty outcrops along Kwanika Creek were first recognized as having copper-molybdenum potential by A. Almond, G. Bleiler, and A. G. Hodgson and were staked in 1964. Hogan Mines Ltd. was incorporated in July 1965 and recommendations from consulting reports by A. F. Reeve (1964) and B. C. MacDonald (1965) were initiated. Bulldozer trenching, assaying, and X-ray drilling (two holes, 87 feet) were done on mineralized outcrops along Kwanika Creek in 1965.

The property was optioned by Canex Aerial Exploration Ltd. in 1966, and their investigation included access roads, line-cutting, geological, geochemical, magnetometer, and induced polarization surveys, trenching, and 11 diamond-drill holes (2,807 feet) before dropping the option.


KWANIKA
CREEK
5
6
6a
9
2
1a
1a?
1b
DDH-A7
DDH-A1
DDH-A2
DDH-A3
PDH1
PDH2
PDH3
py, cp
py, mo, cp
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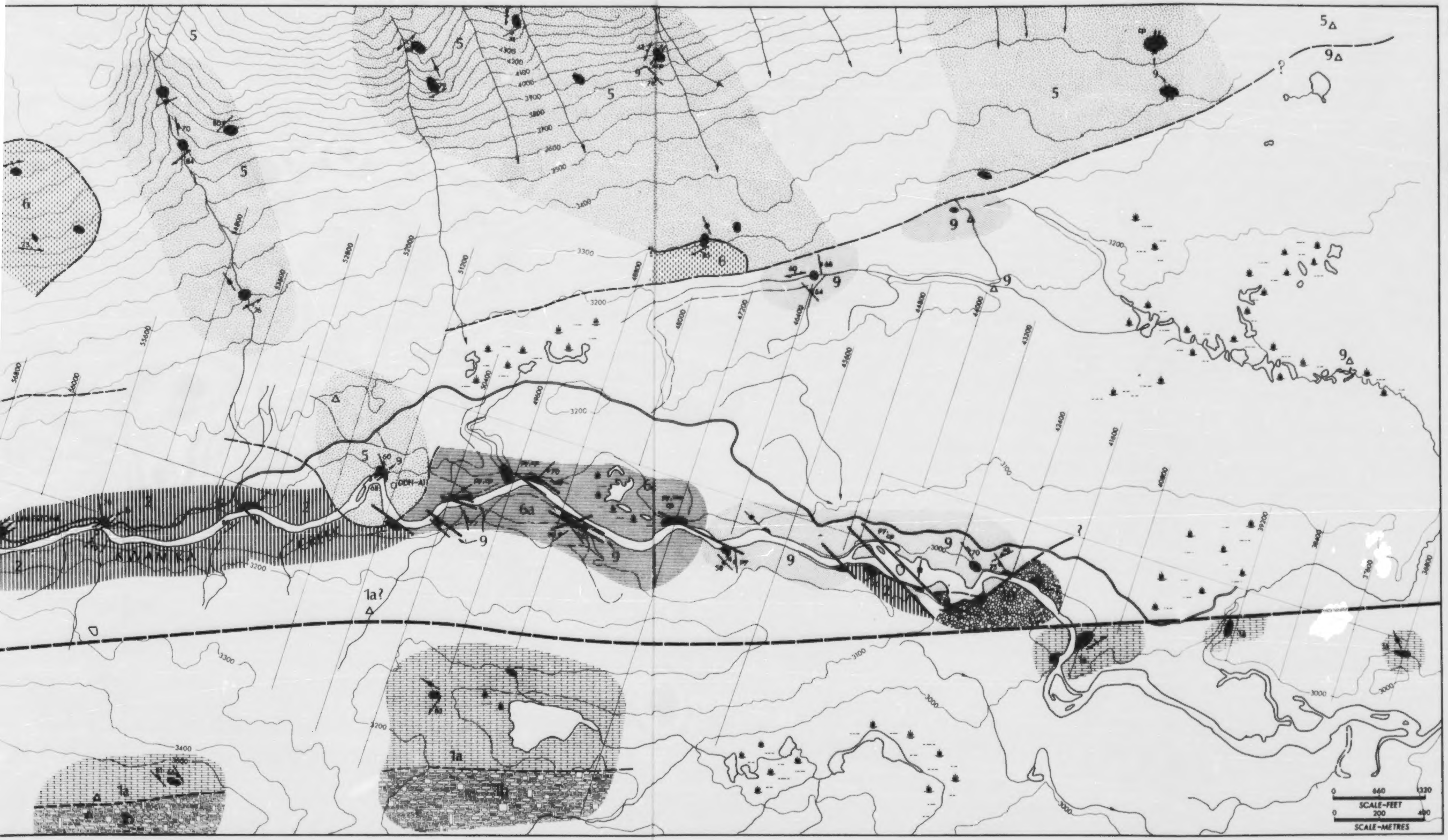


GEOLOGY OF THE KWANIKA PROPERTY

Figure 59

LEGEND

UPPER CRETACEOUS (?)

▨ POLYMICT BOULDER CONGLOMERATE - RED (HEMATITIC) MATRIX ; BOULDERS MAINLY GREEN ALTERED MED GRAINED INTRUSIVE ROCK ; MINOR BLACK ARGILLITE BOULDERS ; BOULDERS APPEAR STEEPLY ORIENTED ALONG PINCHI FAULT TRACE

HOGEM BATHOLITH

LOWER CRETACEOUS (?)

9 QUARTZ MONZONITE ; GRANITE - ORANGE , MED GRAIN, LEUCOCRATIC TO HOLOFELSIC ; LOCALLY PORPHYRITIC HIGHLY FRACTURED AND FAULTED , RUSTY (PYRITE , LIMONITE) ; PERVASIVE SERICITIC ALTERATION OF FELDSPARS COMMON ; CUT BY DARK GREEN-BLACK APHANITIC DYKES

LOWER JURASSIC (?)

6a HYBRID QUARTZ BEARING MONZONITE - PINK-GREEN MOTTLED LEUCOCRATIC , HIGHLY ALTERED (EPIDOTE ; CHLORITE , SERICITE , POTASH FELDSPAR , BIOTITE) LOCALLY HIGHLY SILICIFIED AND PYRITIZED ; MODERATE TO INTENSE FRACTURING ALONG COMPLEX CONTACTS WITH INTERFINGERING UNIT 9

6 MONZONITE ; QUARTZ BEARING MONZONITE - GREY , ORANGE, BLACK MOTTLED , MED GRAIN , MAINLY LEUCOCRATIC ; LOCALLY UP TO 40 % MAFICS WITH MODERATE CHLORITE - EPIDOTE ALTERATION

5 MONZODIORITE - DIORITE - GREYBLACK , MED GRAIN , MAINLY MESOCRATIC (BIOTITE - HORNBLENDE) HAS QUARTZ BEARING VARIETIES LOCALLY FOLIATED , POTASH FELDSPATHIZED, WITH SECONDARY BIOTITE ALTERATION ; CUT BY PEGMATITIC EPIDOTE - QUARTZ - FELDSPAR DYKES, QUARTZ DIORITE DYKES

UPPER TRIASSIC

TAKLA GROUP

2 BANDED ARGILLITE , BROWN BLACK , LOCALLY CONTORTED, CUT BY FELSIC DYKES ; MINOR GREYWACKE , LIMESTONE

PERMIAN

CACHE CREEK GROUP

1a 1b LIMESTONE , GREY , MASSIVE , GABBRO , SERPENTINITE

Unit numbers correspond to those appearing on the regional geology map of Kwanika Creek Area (Figure 57)

SYMBOLS

GEOLOGICAL CONTACTS - APPROXIMATE , ASSUMED	
JOINTS	
FOLIATIONS	
BEDDING	
MINOR FAULTS	
PINCHI FAULT ZONE , APPROXIMATE TRACE	
OUTCROP AREAS INVESTIGATED	
MAPPABLE RUBBLE AREA	△
AREAS OF GEOLOGICAL INTERPOLATION	SOLID PATTERN
AREAS OF OVERBURDEN COVER	SCREENED PATTERN
DIAMOND DRILL HOLE LOCATION - VERTICAL , INCLINED	○ . ○
PERCUSSION DRILL HOLE	●
PYRITE , CHALCOPYRITE , MOLYBDENITE , CINNABAR , CHROMITE	py, cp, mo, Hg, Cr

In 1969, Great Plains Development Company of Canada, Ltd. optioned the property and completed a magnetometer survey and seven diamond-drill holes (4,328 feet) before dropping the option in 1970.

The name Hogan Mines Ltd. was changed to Bow River Resources Ltd. in 1971. During 1972, following a report prepared by R. H. Seraphim, the company drilled six percussion holes (1,600 feet) in the area of the previous drilling.

The property was visited and reported on by British Columbia Department of Mines and Petroleum Resources geologists A. Sutherland Brown in 1965 and N. C. Carter in 1970. During the field season of 1972, the writer, assisted by J. P. Franzen and D. V. Lefebure, spent 10 days mapping, investigating showings, and logging core on the property. The following description is the result of this survey.

DESCRIPTION

Rock Types: Outcrops within the claim boundaries are scarce, occurring mainly along the banks of Kwanika Creek, where stream erosion has cut through a cover of fluvial-glacial overburden varying from 10 to 60 feet in thickness. Extrapolation was necessary in the production of Figure 59, but was kept within reasonable limits, and therefore large areas with overburden cover were left unclassified. Certain assumed boundaries were determined on the basis of a ground magnetometer survey made available to the writer by the company.

Rock types mapped within the property boundaries are numbered in the legend to correspond with the regionally mapped units on Figure 57. Basic to intermediate intrusive rocks (units 5 and 6) which are the major units of the Hogem batholith on the ridges rising to the east, are intruded by a granitic phase (unit 9) along the Kwanika Creek valley. Dykes and stringers of quartz-epidote-orthoclase pegmatite commonly cut units 5 and 6 on these west-facing slopes, and are considered to emanate from the unit 9 body. Locally, subtle alignment of feldspars and mafic minerals defines a foliation along contact zones in these units. The extent of the granitic rocks has not been exactly determined to the north and south of the property, but appears to be a northward pointing wedge-shaped body intruded between the more basic Hogem units and the Pinchi Fault Zone.

Two areas of hybrid rock (unit 6A) have been mapped as representing an altered contact zone between units 6 and 9. In detail, the hybrid rocks can be separated into quartz-rich, mafic-poor portions (unit 9) and portions with significantly less quartz and some increase in mafic content (unit 6). Unit 6A is therefore considered to be composed of light-coloured leucocratic quartz monzonite intruding and contaminating mainly unit 6 monzonite by silicification and hydrothermal alteration of feldspars and mafic minerals.

Investigation of drill core revealed numerous dark green-black aphanitic dykes cutting units 9 and 6A. They are sometimes highly chloritized but unmineralized. Inclusions of similar appearance were noted in outcrops along Kwanika Creek.

The two areas of hybrid rock are separated partly by unit 5 monzodiorite, but mainly by unit 2 banded argillite and minor greywacke. The argillites trend northwesterly, dip steeply, and exhibit slaty cleavage parallel to the thin interbands of black argillite and brown siltstone. Locally intense fracturing and minor concentric folds with highly fractured hinges are common. This unit is cut by fine-grained leucocratic dioritic dykes at some localities.

TABLE 1 – DRILLING INFORMATION

DRILL HOLE NO.	TYPE	APPROXIMATE LOCATION (Fig. 59)	BEARING/DIP (degrees)	CASING (feet)	DEPTH (feet)	AVERAGE ASSAY		OPERATOR	DATE DRILLED
						%Cu	%Mo		
X-1	X-ray	59200N east bank – Kwanika Ck.	?	–	47	0.26	Tr.	Hogan Mines	1965
X-2	X-ray	59700N west bank – Kwanika Ck.	?	–	40	0.53	0.01	Hogan Mines	1965
A-1	AX	60820N south bank – Kwanika Ck.	–/90	15	464	0.04	–	Canex Aerial Exp.	Aug. 1966
A-2	AX	60020N east of Kwanika Ck.	–/90	49	201	0.12	–	Canex Aerial Exp.	Aug. 1966
A-3	AX	59200N east of Kwanika Ck.	–/90	34	200	0.19	–	Canex Aerial Exp.	Aug. 1966
A-4	AX	60820N east of Kwanika Ck.	–/90	106	325	not assayed		Canex Aerial Exp.	Aug. 1966
A-5	AX	60820N east of Kwanika Ck.	–/90	42	220	170' - 220' only 0.16	0.02	Canex Aerial Exp.	Sept. 1966
A-6	AX	62420N east of Kwanika Ck.	–/90	98	311	–	–	Canex Aerial Exp.	Sept. 1966
A-7	AX	63200N east of Kwanika Ck.	–/90	81	298	–	–	Canex Aerial Exp.	Sept. 1966
A-8	AX	58200N east of Kwanika Ck.	–/90	15	248	0.06	–	Canex Aerial Exp.	Sept. 1966
A-9	AX	58200N west of Kwanika Ck.	270/60	15	355	–	–	Canex Aerial Exp.	Sept. 1966
A-10	AX	58200N east of Kwanika Ck.	090/60	27	27	not assayed		Canex Aerial Exp.	Sept. 1966
A-11	AX	51200N east of Kwanika Ck.	–/90	20	128	not assayed		Canex Aerial Exp.	Sept. 1966

B-1	BQ	59200N west bank – Kwanika Ck.	090/75	7	392	0.26	Tr.	Great Plains Dev.	Apr. 1969
B-2	BQ	59700N west bank – Kwanika Ck.	090/75	10	381	0.25	Tr.	Great Plains Dev.	Apr. 1969
B-3	BQ	60020N west of Kwanika Ck.	090/65	84	402	Tr.	–	Great Plains Dev.	Apr. 1969
B-4	BQ	60200N west bank – Kwanika Cr.	105/75	22	432	0.17	0.01	Great Plains Dev.	Apr. 1969
B-5	BQ	58800N east side – Kwanika Ck.	290/75	12	359	not assayed		Great Plains Dev.	Apr. 1969
C-1	BQ	59700N east side – Kwanika Ck.	015/60	30	1,192	0' - 610' 0.17	–	Great Plains Dev.	Aug. 1970
						610' - 1,192' 0.06	–		
C-2	BQ	59700N east side – Kwanika Ck.	140/60	28	1,170	0' - 620' 0.21	0.008	Great Plains Dev.	Aug. 1970
						620' - 1,170' 0.04	0.005		
P-1	Percussion	63000N south bank – Kwanika Ck.	–/90	10	300	0.04	–	Bow River Res. (Hogan Mines)	Aug. 1972
P-2	Percussion	62750N north of Kwanika Ck.	–/90	30	300	0.03	–	Bow River Res. (Hogan Mines)	Aug. 1972
P-3	Percussion	63300N north of Kwanika Ck.	–/90	50	300	0.09	–	Bow River Res. (Hogan Mines)	Aug. 1972
P-4	Percussion	58700N east of Kwanika Ck.	–/90	30	300	0.16	–	Bow River Res. (Hogan Mines)	Aug. 1972
P-5	Percussion	58450N east of Kwanika Ck.	–/90	30	300	0.17	–	Bow River Res. (Hogan Mines)	Aug. 1972
P-6	Percussion	59100N east of Kwanika Ck.	–/90	30	300	0.15	–	Bow River Res. (Hogan Mines)	Aug. 1972

TABLE 2

DRILL HOLE NO.	ROCK TYPES	ALTERATION	FRACTURING	MINERALIZATION
X-1	?	?	?	pyrite chalcopyrite molybdenite
X-2	?	?	?	pyrite chalcopyrite molybdenite
A-1	UNIT 6/6A locally cut by andesite dykes	epidote-chlorite, sericitized feldspar, K-feldspathization, local silicification by veinlets, flooding	strong; filled with calcite, chlorite, hematite; local brecciation, gouge	pyrite; disseminated, in fractures; minor chalcopyrite
A-2	UNIT 9 interfingering with UNIT 6A	as above	intense; intersects large, brecciated fault zone; fractures filled with hematite, calcite, chlorite, clay (?)	as above – increased values corresponds to increased altered mafic content and quartz veining, flooding
A-3	UNIT 9 interfingering with UNIT 6A	as above – increased silicification	strong; with local fault zones	as above – molybdenite noted in siliceous zones
A-4	UNIT 6 cut by numerous quartz-K-feldspar-epidote pegmatite dykes, veins (UNIT 9 ?)	epidote-chlorite, local K-feldspathization	moderate; locally strong	very rare pyrite
A-5	UNIT 9 cut by large andesite dyke	epidote-chlorite, sericitized feldspar	strong to intense with brecciated zones	pyrite; disseminated, in fractures; minor chalcopyrite, molybdenite in siliceous zones enveloping areas of increased mafic content
A-6	UNIT 9 cutting UNIT 6 (cut by grey feldspar porphyry dyke ?)	relatively fresh	strong to intense; with quartz, calcite veining, hematite staining	trace pyrite
A-7	UNIT 9	relatively fresh, epidote-chlorite, increase in biotite content near bottom	intense; central portion intersects highly brecciated zone	trace magnetite
A-8	UNIT 6/6A ? interfingers of UNIT 9	silicification dominant	intense; fractures healed by silicification; also chlorite, calcite fillings	pyrite; rare chalcopyrite

A-9	UNIT 6	hornblende to chlorite, minor K-feldspathization	locally intense; two minor fault zones intersected, hematite, chlorite, calcite fracture filling	erratic disseminated pyrite; rare chalcopyrite
A-10	abandoned in overburden at 27 feet			
A-11	UNIT 5	fresh, weak hornblende to chlorite	moderate; filled with quartz and younger calcite veinlets	nil
B-1	UNIT 6A (altered granodiorite, quartz diorite ?), cut by andesite dyke	epidote-chlorite, K-feldspathization, silicification, clay minerals, sericitization	intense; with numerous brecciated zones; slickensides; calcite, chlorite, hematite coatings	pyrite; disseminated, in fractures; quartz veins; minor chalcopyrite, best near siliceous flooding of zones of high altered mafic content
B-2	UNIT 6A, altered and cut by UNIT 9	epidote-chlorite-clay, silicification, K-feldspathization, sericitization	intense	as above
B-3	UNIT 6A ? cut by andesite dyke	epidote-chlorite	moderate; calcite, hematite, chlorite fillings	pyrite; disseminated, in fractures; rare chalcopyrite
B-4	UNIT 6/6A ? cut by andesite dyke; cut by grey feldspar porphyry dyke	epidote-chlorite, silicification, K-feldspathization, sericitization, clay minerals	intense; brecciated zones	pyrite; disseminated, in fractures; minor chalcopyrite, molybdenite, best near siliceous flooding of zones of high altered mafic content
B-5	UNIT 9 breccia	fault gouge, calcite, clay, chlorite	brecciated fault zone ?	pyrite, trace chalcopyrite, molybdenite
C-1	UNIT 6/6A to 610'; 610' - 1142' – UNIT 9 cut by numerous andesite dykes	epidote-chlorite, K-feldspathized	moderate	pyrite, minor chalcopyrite, bornite, best values as in B-4
C-2	UNIT 6/6A interfingered with UNIT 9 to 620'; 620' - 1170' – UNIT 9, occasional andesite dykes	epidote-chlorite, silicification	moderate; occasional brecciated zones throughout	as above

Near the south end of the claim block, outcrops of red boulder conglomerate (unit 10) occur in faulted contact with unit 9 intrusives. Aligned oblate boulders define a vertical, northerly striking foliation, and may represent a mechanical rotation of rigid boulders within a passive matrix due to late movement along the adjacent Pinchi Fault Zone.

On the west side of the Pinchi Fault trace, Cache Creek Group rocks are mainly massive limestone/dolomite. However, outcrops of gabbro and serpentinite were also mapped. A narrow vein of chromite occurs in the northern portion of the mapped area, and magnesite was identified by X-ray diffraction as a constituent of the surrounding serpentinite. A blue mineral encrusted on fractures through the serpentinite was identified by X-ray as clino-chrysotile. Immediately north of this area, cinnabar occurs in tiny veinlets in a highly fractured, altered mariposite quartzite zone.

Faulting and Fracturing: Accurate location of the main lineament of the Pinchi Fault Zone was not possible due to extensive cover in this area. Eastward-facing scarps of Cache Creek limestone/dolomite occur both north and south of this claim block and are considered to define the major fault trace in those areas. The trace appearing on Figure 59 was determined partly by the eastern limit of Cache Creek limestone/dolomite outcrops and partly by aerial photo interpretation of subtle northwesterly trending topographic linears.

It is clear, however, that outcrops of both intrusive and metasedimentary strata adjacent to this trace exhibit intense fracturing, faulting, and brecciation on the outcrop scale, and obvious cataclastic textures on the microscopic scale. The majority of the minor (branch) faults trend north to northeast, with steep dips and shallowly plunging slickensides. Fracture patterns are locally consistent, but on a property scale, show random distribution. A north to northeast-trending set of fractures has been obscured by later fracturing and brecciation. Some fracures are coated with chlorite and hematite; others have been filled with quartz veinlets and pyrite (chalcopyrite) stringers. These fractures are cut by open fractures and others filled with calcite. It is clear that several generations of movement in this zone have been recorded, from pre to post-mineralization in age.

Alteration: On the slopes to the east of the grid area, the fresh unit 5 rocks locally contain black biotite clusters and orange-green bleached zones of K-feldspar-epidote alteration. In the Kwanika Creek valley, orange, leucocratic to holofelsic quartz monzonites exhibit moderate to intense pervasive sericitization and sausseritization of all feldspars. Within the unit 6A hybrid zone, the previously mentioned alteration is accompanied by potash feldspathization of plagioclase grains and intergranular and veinlet quartz flooding. Fresh green-brown secondary biotite is a rare constituent in some hybrid rocks, but is abundant in one mineralized specimen taken from an outcrop on Kwanika Creek near line 50400. The most visible alteration products noted in the intensely pyritized and fractured trenches along Kwanika Creek were epidote-chlorite and K-feldspar.

As noted previously, calcite fracture filling appears to be the latest alteration event, cutting fractures filled with chlorite, quartz, and sulphides.

Mineralization: Pyrite is by far the most abundant sulphide, occurring as disseminations and fracture fillings in silicified and brecciated zones within units 6A and 9. Rusty limonite cappings were noted in mineralized outcrops along Kwanika Creek in the southern hybrid zone. Native copper has been reported in rusty trenched areas in the north hybrid zone. Malachite-stained fractures are common.

Investigation of diamond-drill core revealed that increase in visible chalcopyrite occurs in mafic-rich zones within unit 6A hybrid rocks which also show increased quartz flooding. Visible molybdenite was noted mainly as disseminations in quartz veins in these chloritic alteration zones. Disseminated chalcopyrite was noted in outcrops containing abundant secondary biotite on Kwanika Creek south of line 50400.

Bornite has been reported in diamond-drill holes C-1 and C-2 (*see* Table 2) and assays from original trenches reported trace gold and minor silver values (from trace to 0.86 ounce per ton).

Detailed information on diamond drilling done from 1965 to the present is contained in Tables 1 and 2, and average assays for copper (and molybdenum) across complete drill-hole depths are indicated in Table 1.

WORK DONE: Percussion drilling, six holes totalling 1,800 feet.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, pp. 105, 106; 1970, pp. 180, 181; *Minister of Mines, B.C.*, Ann. Repts., 1965, pp. 105, 106; 1966, p. 119; 1967, p. 119; Armstrong, J. E., *Geol. Surv., Canada*, 1949, Mem. 252; 1944, Paper 44-5; 1942, Paper 42-11.

FUM (No. 51, Fig. D)

LOCATION: Lat. 55° 18'-19' Long. 125° 04'-05.3' (93N/6E)
OMINECA M.D. North of Mount Nation, 5 miles east-northeast of the junction of Nation River and Tchentlo Lake.

CLAIMS: FUM 1 to 30.

ACCESS: By helicopter from Fort St. James, approximately 80 miles.

OWNER: COLIN J. CAMPBELL, Box 1070, Vanderhoof.

WORK DONE: Line-cutting on Fum 1-8, 13-18.

REFERENCE: Assessment Report 3854.

NOBLE (No. 20, Fig. D)

LOCATION: Lat. 55° 25.7'-27' Long. 125° 08'-10.5' (93N/6E)
OMINECA M.D. At 4,500 to 5,000 feet elevation on Halobia Creek, 5 miles east-northeast of the north end of Indata Lake.

CLAIMS: NOBLE 1 to 20, 35, 36, 45 to 52.

ACCESS: By helicopter from Germansen Landing, approximately 30 miles.

OWNER: UNION MINIERE EXPLORATIONS AND MINING CORPORATION LIMITED, 200, 4299 Canada Way, Burnaby.

DESCRIPTION: Intrusive rocks of the Hogem batholith on and surrounding the property comprise dark, altered granodiorite and fresh, pinkish granite cut locally by aplite dykes and quartz veins.

WORK DONE: Geochemical soil survey, 369 samples covering the central part of the claims during 1971. Induced polarization survey, 6.8 line-miles and magnetometer survey, 12.5 line-miles covering Noble 2-4, 11-16, 21-23, 25, 26, 46-48; and surface diamond drilling, five holes totalling 1,139 feet on Noble 2, 12, 13, 14 during 1972.

REFERENCE: Assessment Report 3611.

LO (No. 155, Fig. D)

LOCATION: Lat. 55° 25.5′ Long. 125° 09′ (93N/6E)
OMINECA M.D. At approximately 4,500 feet elevation at the head of Halobia Creek, 5 miles east-northeast of the north end of Indata Lake.

CLAIMS: LO 1 to 16, 1 to 6 Fractions.

ACCESS: By helicopter from Germansen Landing, 32 miles.

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, Box 2169, Smithers.

METAL: Copper.

DESCRIPTION: Chalcopyrite mineralized fractures and disseminations in a syenodiorite of the Hogem batholith.

WORK DONE: Geochemical soil survey, 165 samples.

HAL (No. 35, Fig. D)

LOCATION: Lat. 55° 27′ Long. 125° 10′ (93N/6E)
OMINECA M.D. Between 4,700 and 5,700 feet elevation near the headwaters of Halobia Creek, 6 miles east of Tsayta Lake.

CLAIMS: HAL 1 to 28, 1 to 12 Fractions.

ACCESS: By helicopter from Germansen Landing, 30 miles.

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, Box 2169, Smithers.

METALS: Copper, molybdenum.

DESCRIPTION: Minor copper and molybdenum occur along contacts of diorite and quartz monzonite.

WORK DONE: Topography mapped; surface diamond drilling, 1 inch equals 1,000 feet; induced polarization survey, 7.5 line-miles; magnetometer survey, 10 line-miles; geochemical soil survey, 589 samples covering all claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 199; Assessment Report 3774.

NIK, SAN (No. 53, Fig. D)

LOCATION: Lat. 55° 30.5′ Long. 125° 11.0′ (93N/6E, 11E)
OMINECA M.D. At approximately 4,500 feet elevation at the headwaters of the southern tributary of Kwanika Creek, 8 miles northeast of Tsayta Lake.

CLAIMS: NIK 1 to 70, 1 to 32 Fractions, SAN 1 to 64, 1 to 28 Fractions.

ACCESS: By helicopter from Germansen Landing, 30 miles.

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, Box 2169, Smithers.

METALS: Copper, molybdenum.

(93N/7W)

DESCRIPTION: Copper mineralization occurs on the San claims in K-feldspathized monzonites near a contact with leucocratic granitic rocks. High copper-molybdenum soil anomalies occur on the Nik claims along the contact between an outlier of basic and ultrabasic rocks of the Hogem batholith and Takla Group volcanic rocks.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 1,000 feet on the San claims and 1 inch equals 400 feet on the Nik claims; induced polarization survey, 10 line-miles covering San and Nik claims; magnetometer survey, 20 line-miles covering the San claims; geochemical soil survey, 2,000 samples covering the San claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 199; Assessment Reports 3856, 3857.

SOONER (No. 137, Fig. D)

LOCATION: Lat. 55° 17.5'-20' Long. 124° 52'-56' (93N/7W)
OMINECA M.D. Between 3,500 and 4,000 feet elevation at the headwaters of Ahdatay Creek, 34 miles southwest of Germansen Landing.

CLAIMS: SOONER 1 to 36, 1 to 16 Fraction.

ACCESS: By helicopter from Germansen Landing, approximately 34 miles.

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, Box 2169, Smithers.

WORK DONE: Induced polarization and resistivity survey, 6.28 line-miles covering Sooner 14-16, 18, 25, 27-30, and 9, 10, 14, and 15 Fractions; reconnaissance geochemical soil survey; magnetometer survey.

REFERENCES: Assessment Reports 3962, 4431.

LUC (No. 160, Fig. D)

LOCATION: Lat. 55° 19' Long. 124° 52' (93N/7W)
OMINECA M.D. Between 3,800 and 4,500 feet elevation 3 miles east of Ahdatay Lake, 6 miles north of Tchentlo Lake.

CLAIMS: CUL 1 to 30.

ACCESS: By helicopter from Fort St. James, 60 miles.

OWNER: CALICO SILVER MINES LTD., 420, 475 Howe Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: The claims are underlain by volcanic rocks and related sedimentary rocks of the Takla Group containing chalcopyrite, pyrite, hematite, and copper carbonates.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet; geochemical soil survey, 236 samples covering all claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 181; Assessment Reports 2450, 3865.

ROYAL (No. 123, Fig. D)

LOCATION: Lat. 55° 20.5' Long. 124° 43' (93N/7E)
OMINECA M.D. At approximately 3,000 feet elevation on the south shore of Klawli Lake, 31 miles south of Germansen Landing.

CLAIMS: ROYAL 1, 2, 5 to 8.

ACCESS: By helicopter from Germansen Landing, 31 miles.

OWNER: UNION MINIERE EXPLORATIONS AND MINING CORPORATION LIMITED, 200, 4299 Canada Way, Burnaby.

DESCRIPTION: A granitic stock of the Omineca Intrusions is in contact with Takla Group volcanic rocks.

WORK DONE: Induced polarization survey, 1.2 line-miles covering Royal 5.8.

DINGLE (No. 154, Fig. D)

LOCATION: Lat. 55° 15.5' Long. 124° 33.0' (93N/7E)
OMINECA M.D. At approximately 4,000 feet elevation 1.5 miles southeast of Klawdetelle Lake, 5 miles north of Chuchi Lake.

CLAIMS: DINGLE 1 to 26, 1 to 10 Fraction.

ACCESS: By helicopter from Smithers, 90 miles.

OWNER: NORANDA MINES, LIMITED, 1050 Davie Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: Chalcopyrite and pyrite mineralization occurs in monzonite of the Hogem batholith and intermediate volcanic rocks of the Takla Group.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; magnetometer survey, 11.93 line-miles; geochemical soil survey, 574 samples covering all claims.

REFERENCE: Assessment Report 4099.

REYNOLDS (No. 63, Fig. D)

LOCATION: Lat. 55° 34'-36.5' Long. 124° 22'-25' (93N/9W)
OMINECA M.D. At approximately 4,000 feet elevation on Boulder Creek, about 6 miles southeast of Manson Creek village.

CLAIMS: REYNOLDS 1 to 4, 1 and 2 Fractions, SPANER 1 to 8, STROH 1 to 9, 1 to 4 Fractions, LESLIE 1 to 8, 1 to 4 Fractions, WRIGHT 1 to 8, DOYLE 1 to 7, 1 Fraction, JO 1 to 10, 13 Fraction, PATTENDEN 1 to 6.

ACCESS: By four-wheel-drive vehicle road from Fort St. James, approximately 105 miles.

OWNER: NORTHERN TUNGSTEN MINES LTD., 5, 1257 Fourth Avenue, Prince George.

WORK DONE: Line-cutting, geochemical soil survey, 343 samples covering Spaner 1-4, 5, 7, Leslie 1-8, Doyle 1-5, 7, Stroh 2, 4, 5-9; road construction approximately 4 miles (on Leslie and Stroh claims); trenching, approximately 1,500 feet on Leslie and Stroh claims.

REFERENCE: Assessment Report 3864.

GERM (No. 153, Fig. D)

LOCATION: Lat. 55° 42.5'-43.5' Long. 124° 49.3'-52' (93N/10W)
OMINECA M.D. At approximately 3,400 feet elevation on the north shore of Germansen Lake, 8 miles southwest of Germansen Landing.

CLAIMS: GERM, totalling 35.

ACCESS: By road from Germansen Landing, approximately 25 miles.

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, Box 2169, Smithers.

METAL: Copper.

DESCRIPTION: Pyrite and minor chalcopyrite occur in Takla Group volcanic rocks.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering north end of claim group; geochemical soil survey, approximately 150 samples covering all claims.

LOOP (No. 55, Fig. D)

LOCATION: Lat. 55° 39.5' Long. 125° 14' (93N/11E)
OMINECA M.D. Between 4,750 and 5,750 feet elevation 10 miles southeast of Old Hogem, 22 miles west-southwest of Germansen Landing.

CLAIMS: LOOP 1 to 16, 1 to 6 Fractions.

ACCESS: By helicopter from Germansen Landing, 22 miles.

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, Box 2169, Smithers.

METAL: Copper.

DESCRIPTION: Chalcopyrite occurs as disseminations and fracture fillings in epidotized and chloritized volcanic rocks of the Takla Group.

WORK DONE: Topography mapped; induced polarization and resistivity survey on Loop 1-4, 9, 10, 12 and 1-4 Fractions.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 202; Assessment Report 3859.

SLIDE, TOM (No. 81, Fig. D)

LOCATION: Lat. 55° 42.2' Long. 125° 13.8' (93N/11E)
OMINECA M.D. At approximately 6,500 feet elevation 3 miles south of the Omineca River, 21 miles west-southwest of Germansen Landing.

CLAIMS: SLIDE, TOM, JEAN, LEE, JIM, totalling 25.

ACCESS: By helicopter from Germansen Landing, 21 miles.

OWNER: KAZA COPPER LTD., 1214 Eastview Road, North Vancouver.

METALS: Copper, silver, gold.

DESCRIPTION: Chalcopyrite and bornite with some silver and gold occur in Takla volcanic rocks near the Hogem batholith.
WORK DONE: Trenching, 85 feet on Slide.

BURN (No. 77, Fig. D)

LOCATION: Lat. 55° 30′-31.5′ Long. 125° 12′-15.5′ (93N/11)
OMINECA M.D. At approximately 4,500 feet elevation 6 miles south of Kwanika Creek, 18 miles southwest of Germansen Landing.
CLAIMS: BURN 1 to 80.
ACCESS: By four-wheel-drive vehicle road from the Kwanika Creek road, 6.5 miles.
OWNER: W. R. Bacon.
OPERATOR: LUC SYNDICATE, 1720, 1055 West Hastings Street, Vancouver 1.
METALS: Molybdenum, copper.
DESCRIPTION: Fracture systems in monzonite are mineralized with pyrite, molybdenite, and chalcopyrite. Molybdenite mineralization is also disseminated in an alaskite dyke.
WORK DONE: Induced polarization survey, 14 line-miles covering Burn 1-5, 9-16, 18, 20-26, 31, 43, 73; surface diamond drilling, 12 holes totalling 5,231 feet on Burn 12-16 and 45.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 202.

RODE (No. 136, Fig. D)

LOCATION: Lat. 55° 31.5′-33.3′ Long. 125° 15.5′-17′ (93N/11W)
OMINECA M.D. Between 3,500 and 4,000 feet elevation on the south side of Kwanika Creek, 7 miles northeast of Tsayta Lake.
CLAIMS: RODE 1 to 58.
ACCESS: By road from Germansen Landing, approximately 30 miles.
OWNER: W. R. Bacon.
OPERATOR: LUC SYNDICATE, 1720, 1055 West Hastings Street, Vancouver 1.
DESCRIPTION: Overburden area is overlying monzonitic and granitic rocks of the Hogem batholith.
WORK DONE: Magnetometer survey, 23 line-miles and geochemical soil survey, 756 samples covering all claims.
REFERENCE: Assessment Report 3998.

LIN (No. 135, Fig. D)

LOATION: Lat. 55° 33′-35.5′ Long. 125° 17′-20′ (93N/11W)
OMINECA M.D. At approximately 3,700 feet elevation on the north side of Kwanika Creek, 8 miles northeast of Tsayta Lake.
CLAIMS: LIN 1 to 72, 74, 76 to 78, 84 to 95, 1 to 5 Fractions.

(93N/11W)

ACCESS: By road from Germansen Landing, 30 miles.
OWNER: W. R. Bacon.
OPERATOR: LUC SYNDICATE, 1720, 1055 West Hastings Street, Vancouver 1.
METALS: Molybdenum, copper.
DESCRIPTION: Minor chalcopyrite and molybdenite occur on fractures within leucocratic granitic rocks of the Hogem batholith.
WORK DONE: Geochemical soil survey, approximately 700 samples covering Lin 1-6, 9-14, 17-30, 46, 50-56, 59-72, and Lin 1-4 Fractions.
REFERENCE: Assessment Report 3997.

HOOEY (No. 54, Fig. D)

LOCATION: Lat. 55° 37.6' Long. 125° 17.7' (93N/11W)
OMINECA M.D. At approximately 5,000 feet elevation on Groundhog Creek, 12 miles north-northeast of Tsayta Lake.
CLAIMS: HOOEY 7 to 12, 15, 16, HOOEY 3, 4, and 6 Fractions.
ACCESS: By helicopter from Germansen Landing, 26 miles.
OWNER: NORANDA EXPLORATION COMPANY, LIMITED, Box 2169, Smithers.
METAL: Copper.
WORK DONE: Induced polarization survey.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 202; Assessment Report 3858.

TWIN (No. 107, Fig. D)

LOCATION: Lat. 55° 40' Long. 125° 18.5' (93N/11W)
OMINECA M.D. At approximately 5,200 feet elevation at the headwaters of Twin Creek, 6 miles south of the Omineca River.
CLAIMS: TWIN 1 to 16, 18, 27, 29, 31, 33, 35, 37, 38, 43, 44.
ACCESS: By helicopter from north of Twin Creek, 26 miles.
OWNER: NBC Syndicate.
OPERATOR: WESFROB MINES LIMITED, 500, 1112 West Pender Street, Vancouver 1.
METAL: Copper.
DESCRIPTION: Disseminated chalcopyrite and pyrite in altered volcanic rocks and monzodiorite cut by syenitic dykes near contact of Takla volcanic rocks with Hogem batholith.
WORK DONE: Magnetometer survey, 10 line-miles covering Twin 28-43.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 203.

IMPERIAL (No. 18, Fig. D)

LOCATION: Lat. 55° 57' Long. 125° 34' (93N/13E)
OMINECA M.D. One mile south of Haha Creek and 2 miles north of the headwaters of Duckling Creek, 40 miles northwest of Germansen Landing.

(93N/13E, 14W)

CLAIMS: IMPERIAL 1 to 6, 8, 9, IMPERIAL 7 Fraction.
ACCESS: By helicopter from Germansen Landing, approximately 40 miles.
OWNER: UNION MINIERE EXPLORATIONS AND MINING CORPORATION LIMITED, 1000, 1055 West Hastings Street, Vancouver 1.
WORK DONE: Magnetometer and induced polarization surveys during 1971.
REFERENCE: Assessment Report 3704.

MISTY (FORE, KAY) (No. 119, Fig. D)

LOCATION: Lat. 55° 56'-57.3' Long. 125° 28'-33' (93N/13E, 14W)
OMINECA M.D. Between 5,500 and 6,000 feet elevation between Duckling and Haha Creeks, 13 miles north-northwest of Old Hogem.
CLAIMS: MISTY 1 to 31, 1 and 2 Fractions, BELL 1 to 46.
ACCESS: By helicopter from Germansen Landing, 40 miles or by four-wheel-drive vehicle road, 45 miles.
OWNER: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.
METALS: Copper, silver.
DESCRIPTION: Chalcopyrite occurs in a gneissic phase of hornblende monzonite which is one phase of the Duckling Creek syenite complex. The gneiss occurs within a northwest-trending shear zone.
WORK DONE: Surface geological mapping, 1 inch equals 100 feet covering Misty 5, 6, and 9 (trenches); road construction, 1.9 miles (tote road connecting claims to Granby's road to the Lorraine property); trenching, 5,015 feet on Misty 5, 6, and 9.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 218.

TAM (No. 91, Fig. D)

LOCATION: Lat. 55° 57.5' Long. 125° 30' (93N/13E, 14W)
OMINECA M.D. Between 5,500 and 6,000 feet elevation 6 miles west of Steele Creek, 14 miles north-northwest of Old Hogem.
CLAIMS: TAM 1 to 20.
ACCESS: By helicopter from Germansen Landing.
OWNER: UNION MINIERE EXPLORATIONS AND MINING CORPORATION LIMITED, 200, 4299 Canada Way, Burnaby.
METAL: Copper.
DESCRIPTION: Disseminated chalcopyrite and bornite occur in sheared, K-feldspathized andesite and in unaltered diorite adjacent to northeast-trending syenite dykes.
WORK DONE: Magnetometer survey, 7.6 line-miles covering Tam 5-10 and 13-18; surface diamond drilling, five holes totalling 2,489 feet on Tam 3, 4, and 5.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 217.

DUCK, DUKE, RONDAH (No. 59, Fig. D)

LOCATION: Lat. 55° 52.5′-55.5′ Long. 125° 15.5′-19.5′ (93N/14W)
OMINECA M.D. Between 3,700 and 6,200 feet elevation 2 miles east of Duckling Creek, 12 miles north-northeast of Old Hogem.

CLAIMS: DUCK, DUKE, RONDAH, LEA, totalling 144.

ACCESS: By four-wheel-drive vehicle road from Germansen Landing, 35 miles.

OWNER: Tyee Lake Resources Ltd.

OPERATORS: MARUBENI CORPORATION CANADA LTD. and COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 5.

METALS: Copper, molybdenum, gold.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Duck, Duke, and Lea claims; induced polarization survey, 8 line-miles and ground magnetometer survey, 8 line-miles covering Duck claims; road construction, 1.5 miles on Duck claims; trenching, 7,300 feet on Duck, Duke, and Lea claims; percussion drilling, eight holes totalling 1,180 feet on Duck claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 213; Assessment Report 3861.

DOROTHY (No. 58, Fig. D)

LOCATION: Lat. 55° 53.5′ Long. 125° 19.5′ (93N/14W)
OMINECA M.D. On the east side of Duckling Creek, 10 miles north-northeast of Old Hogem.

CLAIMS: DOROTHY 1 to 6, 8, 9, ELIZABETH 1 to 6, ELDER 21 to 38, 45 to 50.

ACCESS: By road from the Omineca road, 10 miles.

OWNER: KENNCO EXPLORATIONS, (WESTERN) LIMITED, 730, One Bentall Centre, Vancouver 1.

METALS: Copper, molybdenum.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Dorothy 1, 3, and 8; road construction, 1 mile (northeast part of property); trenching, 2,690 feet on Dorothy 1, 3, and 8.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 214; Assessment Report 3855.

LORRAINE (No. 90, Fig. D)

LOCATION: Lat. 55° 55.5′ Long. 125° 26.0′ (93N/14W)
OMINECA M.D. At approximately 5,500 feet elevation 2.5 miles north of the headwaters of Duckling Creek, 35 miles northeast of Germansen Landing.

CLAIMS: LORRAINE 1 to 12, 1 to 3 Fractions, LOREX 1 and 2, GK 1 to 108, 109 and 110 Fractions.

ACCESS: By helicopter from Germansen Landing, 35 miles.

(93N/14W)

OWNER: Kennco Explorations, (Western) Limited.

OPERATOR: THE GRANBY MINING COMPANY LIMITED, 2000, 1055 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Chalcopyrite, bornite, and secondary chalcocite occur in monzonite and syenite.

WORK DONE: Surface geological mapping, 1 inch equals 100 feet covering Lorraine 2-4; magnetometer survey (fill-in), 3 line-miles; road construction, 12 miles (from Duck, Duke, Rondah property); trenching, 6,000 feet on Lorraine 1, 2, and 4; surface diamond drilling, four holes totalling 2,534 feet on Lorraine 2 and 4; percussion drilling, 23 holes totalling 8,105 feet on Lorraine 1, 2, and 4.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 215, 216.

FOX (No. 61, Fig. D)

LOCATION: Lat. 55° 55.5' Long. 125° 19.5' (93N/14W)
OMINECA M.D. On Duckling Creek, 12 miles north-northeast of Old Hogem.

CLAIMS: FOX 1 to 41, FOX 43 to 47 Fractions.

ACCESS: By road from Germansen Landing, approximately 25 miles.

OWNER: ACANO EXPLORATIONS LIMITED, 2070, 777 Hornby Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Malachite, pyrite, chalcopyrite, and bornite occur in fractures in diorite and monzonite.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; geochemical soil survey, 762 samples; surface diamond drilling, 1,000 feet.

REFERENCE: Assessment Report 3860.

TED (No. 121, Fig. D)

LOCATION: Lat. 55° 55.6' Long. 125° 24.0' (93N/14W)
OMINECA M.D. On Duckling Creek, 11 miles north-northeast of Old Hogem at 4,500 feet elevation.

CLAIMS: TED, totalling 117.

ACCESS: By four-wheel-drive vehicle road from Germansen Landing, 40 miles.

OWNER: TUPCO MINES LTD., 330, 470 Granville Street, Vancouver 2.

METAL: Copper.

DESCRIPTION: The claims lie entirely within the Hogem batholith. Rock exposed on the property consists mainly of diorite, syenite, and monzonite, with dykes of pegmatite.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; induced polarization survey, 6.7 line-miles covering 24 claims; geochemical soil survey, 1,456 samples.

REFERENCES: Assessment Reports 4151, 4152.

COL (No. 19, Fig. D)

LOCATION: Lat. 55° 56.7' Long. 125° 25.8' (93N/14W)
OMINECA M.D. Between Duckling and Haha Creeks, 12 miles north of Old Hogem.

CLAIMS: COL 1 to 32, 51 to 58.

ACCESS: By helicopter or four-wheel-drive vehicle road from Germansen Landing, 30 miles.

OWNER: W. R. Bacon.

OPERATOR: LUC SYNDICATE, 1720, 1055 West Hastings Street, Vancouver 1.

DESCRIPTION: The claims are underlain by basic rocks intruded by the Duckling Creek syenite complex, phases of the Hogem batholith.

WORK DONE: Claims mapped; surface geological mapping, 1 inch equals 400 feet; geochemical soil sampling.

REFERENCE: Assessment Report 3610.

LINC (No. 120, Fig. D)

LOCATION: Lat. 55° 56.8' Long. 125° 17.3' (93N/14W)
OMINECA M.D. At approximately 5,000 feet elevation 2.5 miles east of Duckling Creek, 14 miles north-northeast of Old Hogem.

CLAIMS: LINC 1 to 16.

ACCESS: By helicopter from the Omineca road, 4 miles.

OWNER: KENNCO EXPLORATIONS, (WESTERN) LIMITED, 730, One Bentall Centre, Vancouver 1.

METAL: Copper.

DESCRIPTION: The property is situated along the east margin of the Hogem batholith where syenites cutting diorites are in contact with Takla cherty sedimentary rocks and andesite. Disseminated copper mineralization has been noted.

WORK DONE: Geochemical survey, 87 silt samples and 170 soil samples covering all claims.

REFERENCE: Assessment Report 3996.

KIP, STL (No. 152, Fig. D)

LOCATION: Lat. 55° 58.5' - 56° 00.5' Long. 125° 20'-26.5'
(93N/14W; 94C/3W)
OMINECA M.D. At approximately 5,000 feet elevation at the headwaters of Steele Creek, 15 miles north of Old Hogem.

CLAIMS: KIP, STL, totalling 94.

ACCESS: By helicopter from Germansen Landing, 30 miles.

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: Chalcopyrite occurs as disseminations in quartz veins and along fractures and intergranular boundaries in syenitic and monzonitiic phases within the Hogem batholith.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 1,000 feet covering STL 1-8 and 1-3 Fractions; induced polarization survey, 5.8 line-miles; geochemical soil survey, approximately 600 samples.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 218; Assessment Reports 3341, 4476.

PIK (No. 76, Fig. D)

LOCATION: Lat. 55° 57′ Long. 125° 27.5′ (93N/14W)
OMINECA M.D. At approximately 5,000 feet elevation at the headwaters of Haha Creek, 12 miles north of Old Hogem.

CLAIMS: PIK 1 to 16, 1 to 6 Fractions.

ACCESS: By helicopter from Germansen Landing, 30 miles.

OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: Copper sulphide mineralization occurs in porphyritic syenite and monzodiorites.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Pik 1, 3, 5, 9-14 and 2, 3, 5, 6 Fractions; geochemical soil survey, approximately 400 samples covering Pik 1, 3, 5, 7-16 and 1-6 Fractions.

REFERENCE: Assessment Report 4522.

VALLEY (No. 60, Fig. D)

LOCATION: Lat. 55° 51′-53′ Long. 125° 11.5′-13.5′ (93N/14E)
OMINECA M.D. At approximately 3,000 feet elevation on the Uslika Lake road, 24 miles northwest of Germansen Landing.

CLAIMS: BOX 1 to 42, 1 to 18 Fractions.

ACCESS: By road from Germansen Landing, 24 miles.

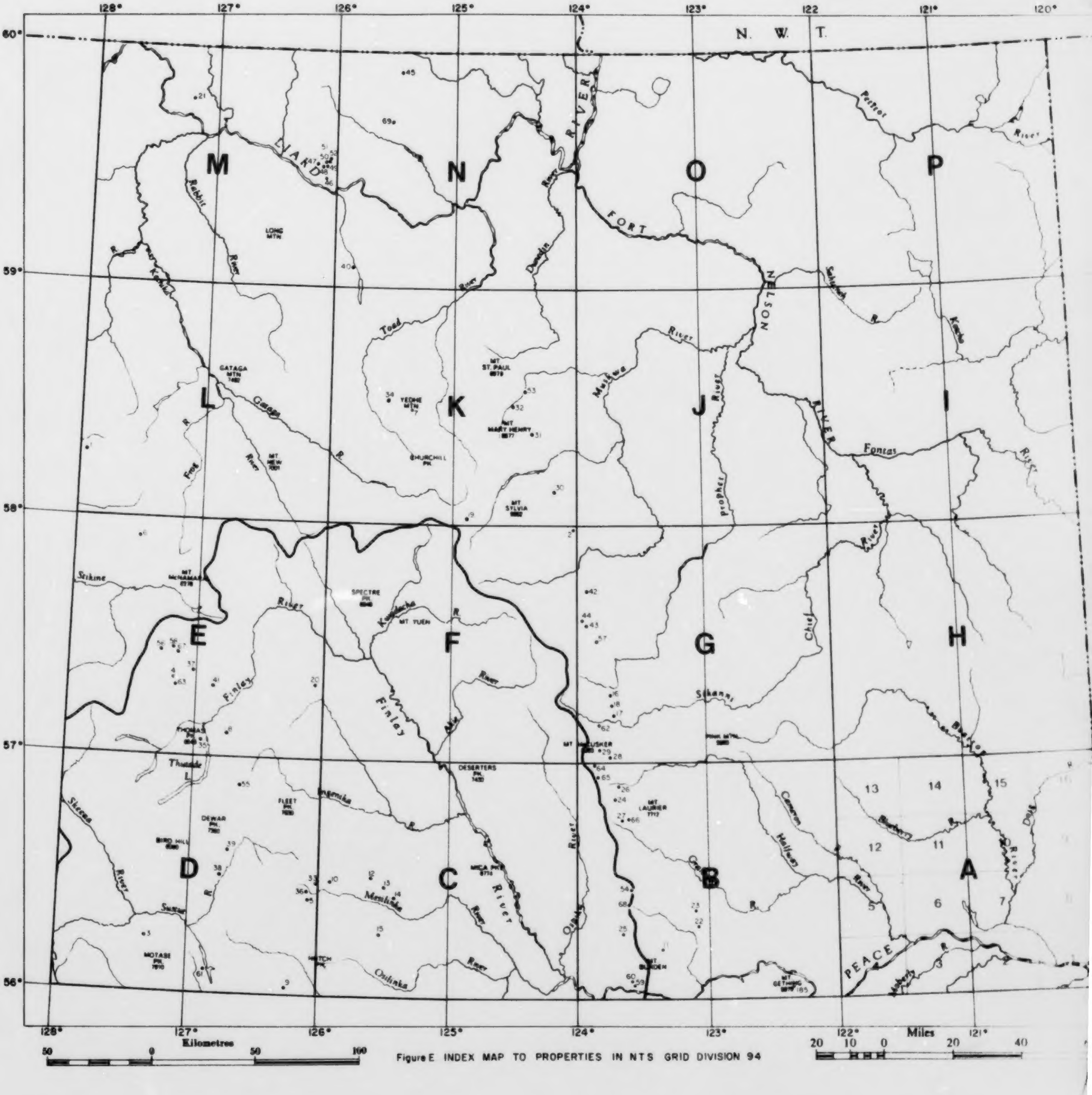
OWNER: NORANDA EXPLORATION COMPANY, LIMITED, 1050 Davie Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: Chalcopyrite occurs disseminated in granitic dykes and in volcanic rocks.

WORK DONE: Topography mapped; magnetometer and induced polarization surveys; geochemical soil survey.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 211; Assessment Reports 3879, 4432.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Kechika
R.
LONG MTN
Toad
River
Dunedin
FORT
NELSON
River
Sahtaneh
R.
Kiwigana
Petitot
River
Muskwa
River
Prophet
River
RIVER
Fontas
River
GATAGA MTN 7450
Gataga
R.
Frog
River
MT HEW 7001
YEDHE MTN
MT ST. PAUL 6979
MT MARY HENRY 6877
CHURCHILL PK
MT SYLVIA 9382
Stikine
MT McNAMARA 6378
SPECTRE PK
Kwadacha
R.
MT TUEN
River
Finlay
Finlay
Akie
River
Chief
Sikanni
Beatton
River
MT McCUSKER
PINK MTN 5900
THOMAS PK
Thutade L
DESERTERS PK 7450
FLEET PK 7000
Ingenika
R.
DEWAR PK 7260
BIRD HILL
MT LAURIER 7717
Cameron
Halfway
River
Blueberry
R.
Doig
River
Skeena
River
Sustut
R.
MICA PK 6710
River
Mesilinka
River
Osilinka
River
Ospika
River
MOTASE PK 7010
HATCH PK
MT BLINDEN
MT GETHING 6077
PEACE
R.
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36
5
15
54
68
23
22
25
60
59
3
61
9
Kilometres
50
0
50
100
Miles
20
10
0
20
40

Figure E INDEX MAP TO PROPERTIES IN NTS GRID DIVISION 94

KEY TO PROPERTIES ON INDEX MAP, FIGURE E.

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3. IN, page 479.
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5. RINGO, page 480.
6. WEST, page 485.
7. MARGE, page 490.
8. ATTYCELLEY, page 482.
9. FRED, BOBO, MARG, page 478.
10. RAVEN, page 477.
11. POCO, page 460.
12. RAIN, page 478.
13. BURN, page 477.
14. SWAN, page 478.
15. PALACE, page 477.
16. SEL, page 488.
17. RB, DEV, JUNE, page 487.
18. MT, HAR, page 487.
19. A, page 490.
20. MD, page 485.
21. BEAR, MOOSE, BEAVER, page 579.
22. NABE, page 462.
23. PRES, QUILLE, page 462.
24. ALFA, BETA, page 476.
25. WL, page 461.
26. ROBB LAKE PROPERTY, page 463.
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29. NORM, page 487.
30. DOG, page 490.
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34. BOB, RIM, MAD, page 492.
35. FIRESTEEL, page 482.
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37. SOM, page 484.
38. DAY, page 479.
39. SUSTUT COPPER, page 481.
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43. RIC, HEW, page 489.
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45. BOW, page 596.
46. GEM, page 590.
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48. FIRE, page 592.
49. TEASER, page 592.
50. CORAL, page 594.
51. CAMP, page 594.
52. TAM, page 595.
53. EAGLE MINE, page 491.
54. LARA, page 461.
55. THOR, page 481.
56. PUT, HUMP, page 483.
57. RUST, page 488.
58. WAS, page 484.
59. CLIFF, LOST, page 460.
60. RUSH, page 460.
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NORTHEAST BRITISH COLUMBIA
(NTS Division 94 Figure E)

HALFWAY RIVER 94B

POCO (No. 11, Fig. E)

LOCATION: Lat. 56° 10.5'-13' Long. 123° 20.4'-23.7' (94B/3W)
LIARD M.D. At approximately 6,500 feet elevation 1 mile east of Mount Burden and 1.5 miles west of the Nabesche River, 100 miles west of Fort St. John.

CLAIMS: POCO 1 to 62.

ACCESS: By helicopter from Fort St. John, 100 miles.

OWNER: UNION OIL COMPANY OF CANADA LIMITED, Box 999, Calgary, Alta.

METALS: Lead, zinc.

DESCRIPTION: A thrust plate of Ordovician and Silurian carbonate rocks and shales overlies shale and arenite of Triassic age. Minor galena and sphalerite occur within dolomite of the overthrust plate.

WORK DONE: Surface geological mapping, 1 inch equals 50 feet and 1 inch equals 300 feet covering all claims.

REFERENCE: Assessment Report 4400.

CLIFF, LOST (No. 59, Fig. E)

LOCATION: Lat. 56° 02'-05.5' Long. 123° 32'-37.5' (94B/4E)
OMINECA M.D. Between elevations of 2,300 and 6,000 feet on the north shore of Williston Lake, 2 miles east of Wicked River.

CLAIMS: CLIFF, LOST, SNOW, JIM, totalling 105.

ACCESS: By helicopter from Mackenzie, 60 miles.

OPERATOR: TROJAN CONSOLIDATED MINES LIMITED, 848 West Hastings Street, Vancouver 1.

DESCRIPTION: The claims are underlain by dolomite and limestone of the Stone and Dunedin Formations of Middle Devonian age.

WORK DONE: Geological mapping, 1 inch equals 1,000 feet covering all claims; geochemical survey, 108 stream silt samples and 206 soil samples.

REFERENCE: Assessment Report 3999.

RUSH (No. 60, Fig. E)

LOCATION: Lat. 56° 02.4'-06' Long. 123° 33'-36' (94B/4E)
OMINECA M.D. Between 3,000 and 5,500 feet elevation north of the Peace River between Hamlyn and Cowart Creeks.

CLAIMS: RUSH 1 to 72.

ACCESS: By helicopter from Mackenzie, 60 miles.

OPERATOR: SICINTINE MINES LTD., 401, 550 Burrard Street, Vancouver 1.

(94B/5E)

DESCRIPTION: Thrusted and folded rocks of Middle Devonian age underlie the property.

WORK DONE: Geochemical stream sediment survey, approximately 35 samples.

WL (No. 25, Fig. E)

LOCATION: Lat. 56° 15'-17' Long. 123° 37.5'-39.8' (94B/5E)
OMINECA M.D. At approximately 3,500 feet elevation on Wicked Lake, 70 miles west-northwest of Hudson Hope.

CLAIMS: WL 1 to 32.

ACCESS: By helicopter from Hudson Hope, 70 miles.

OWNER: Cordilleran Engineering Ltd.

OPERATOR: LADY LAURIER JOINT VENTURE, c/o Cordilleran Engineering Ltd., 1418, 355 Burrard Street, Vancouver 1.

METALS: Copper, lead, zinc.

DESCRIPTION: Ordovician rocks are thrust onto Devonian strata.

WORK DONE: Reconnaissance surface geological mapping, 1 inch equals 1,000 feet; geochemical survey, 218 soil samples and 28 rock chip samples covering all claims.

REFERENCE: Assessment Report 4141.

RUSH (No. 68, Fig. E)

LOCATION: Lat. 56° 22'-25' Long. 123° 35.5'-39' (94B/5E)
OMINECA and LIARD M.D. Between 5,600 and 6,500 feet elevation on the north side of Gauvreau Peak, at the headwaters of Nabesche River.

CLAIMS: RUSH 1 to 65.

ACCESS: By helicopter from Fort St. John, 110 miles.

OWNER: SPARTAN EXPLORATIONS LTD., 3165 Dunbar Street, Vancouver 8.

DESCRIPTION: The property is underlain by folded Silurian and Middle Devonian carbonate sedimentary rocks.

WORK DONE: Surface geological mapping, 1:50,000.

REFERENCE: Assessment Report 4297.

LARA (No. 54, Fig. E)

LOCATION: Lat. 56° 27' Long. 123° 36' (94B/5E)
OMINECA M.D. Between 4,300 and 6,000 feet elevation near Aley Creek, 32 miles northeast of Finlay Forks and 110 miles west of Fort St. John.

CLAIMS: LARA 43 to 52.

ACCESS: By helicopter from Fort St. John, 110 miles.

OWNER: MONETA PORCUPINE MINES LIMITED, 420, 475 Howe Street, Vancouver 1.

DESCRIPTION: Thrust faulted and folded Ordovician and Silurian strata underlie the property.

(94B/5E, 6W, 12E, 13W)

WORK DONE: Preliminary surface geological mapping; geochemical soil survey, 160 samples covering all claims.

REFERENCE: Assessment Report 4195.

BRIN (No. 27, Fig. E)

LOCATION: Lat. 56° 15′ - 57° 15′ Long. 123° 25′-55′ (94B/5E, 6W, 12E, 13W; 94G/4W)
LIARD and OMINECA M.D. From Nabesche River to Sikanni Chief River, Robb Lake area.

CLAIMS: BRIN 1 to 645; LOW 75 to 82; ACE and LINDA, totalling 120; VALE 63, 64; ALPINE 48 to 58, 62; KNOB 59 to 61; QUAD 71 to 74; PAIR 69, 70.

ACCESS: By aircraft from Mackenzie, 100 to 150 miles.

OPERATOR: BRITISH NEWFOUNDLAND EXPLORATION LIMITED, 704, 602 West Hastings Street, Vancouver 2.

DESCRIPTION: Middle Devonian carbonate rocks are underlain by Silurian rocks and overlain by Upper Devonian shales. The local geology is complicated by imbricate thrusting and folding.

WORK DONE: Surface geological mapping, 1:50,000 covering Brin, Ace, and Linda claims; geochemical soil, silt, and rock survey, 5,050 samples covering all claims.

REFERENCES: Assessment Reports 3976, 4142, 4204.

NABE (No. 22, Fig. E)

LOCATION: Lat. 56° 15′-20.3′ Long. 123° 23.2′-28′ (94B/6W)
LIARD M.D. Between 5,000 and 6,000 feet elevation at the headwaters of Nabesche River, 20 miles north of the Peace River.

CLAIMS: NABE 1 to 141, BLOW 1 to 44.

ACCESS: By helicopter from Finlay Forks, 26 miles.

OWNERS: Cominco Ltd. and BX Development Ltd.

OPERATOR: COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 5.

DESCRIPTION: Minor sphalerite occurs in reefal dolomite of the Middle Devonian Dunedin Formation.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet covering all claims; geochemical soil survey covering Nabe claims; surface diamond drilling, two holes totalling 133 feet on Nabe claims and five holes totalling 794 feet on Blow claims.

PRES, QUILLE (No. 23, Fig. E)

LOCATION: Lat. 56° 22.3′ Long. 123° 27′ (94B/6W)
LIARD M.D. At the head of Nabesche River, 65 miles northwest of Hudson Hope.

CLAIMS: PRES 1 to 20, QUILLE 1 to 24.

(94B/12E, 13E)

ACCESS: By helicopter from Hudson Hope, 65 miles.
OWNER: Cordilleran Engineering Ltd.
OPERATOR: LADY LAURIER JOINT VENTURE, c/o Cordilleran Engineering Ltd., 1418, 355 Burrard Street, Vancouver 1.
DESCRIPTION: Dolomite, limestone, and shale of the Middle Devonian Stone, Dunedin, and Besa River Formations are exposed on the western flank of the north-trending Bernard anticline.
WORK DONE: Reconnaissance surface geological mapping, 1 inch equals 1,000 feet; reconnaissance silt and soil survey, 253 samples covering all claims.
REFERENCE: Assessment Report 4255.

ASH (No. 66, Fig. E)

LOCATION: Lat. 56° 44.5'-46' Long. 123° 36'-39' (94B/12E, 13E)
LIARD M.D. On a tributary of Horn Creek, 4 miles west of Mount Laurier, 115 miles northwest of Fort St. John.
CLAIMS: ASH 1 to 8, 27 to 34, 36, 53 to 62.
ACCESS: By helicopter from Fort St. John.
OWNER: BRALORNE RESOURCES LIMITED, 1005, Two Bentall Centre, Vancouver 1.
DESCRIPTION: The property is underlain by Upper Devonian Besa River Formation shales.
WORK DONE: Geochemical soil survey.
REFERENCE: Assessment Report 4144.

ROBB LAKE PROPERTY (No. 26, Fig. E)

By R. I. Thompson

LOCATION: Lat. 56° 55' Long. 123° 40' (94B/13W)
LIARD M.D. Five miles northeast of Robb Lake which is 50 miles west of Pink Mountain (Mile 150 on the Alaska Highway).
CLAIMS: CLEO, ROB, FG, MV, etc., totalling approximately 900.
ACCESS: By helicopter from Pink Mountain (Mile 150 on the Alaska Highway) or by fixed-wing aircraft from Mackenzie.
OWNERS: TEXASGULF, INC., ARROW INTER-AMERICA CORPORATION, and BARRIER REEF RESOURCES LTD., 1418, 355 Burrard Street, Vancouver 1.
METALS: Zinc, lead.
DESCRIPTION:

INTRODUCTION: One week in 1972 and two weeks in 1973 were spent at Robb Lake to familiarize the author with the nature and geologic setting of recently discovered (September 1971) stratabound lead-zinc occurrences. Helpful cooperation of Cordilleran Engineering Ltd.'s geologists is appreciated; however, responsibility for all statements rests with the author. The following is a brief overview of salient geological features.

REGIONAL GEOLOGIC FRAMEWORK: Robb Lake area is located in the Middle Ranges of northern Rocky Mountains at the headwaters of Halfway River (Fig. 60). The area is contained within a north-northwest-trending belt of Lower and Middle Paleozoic

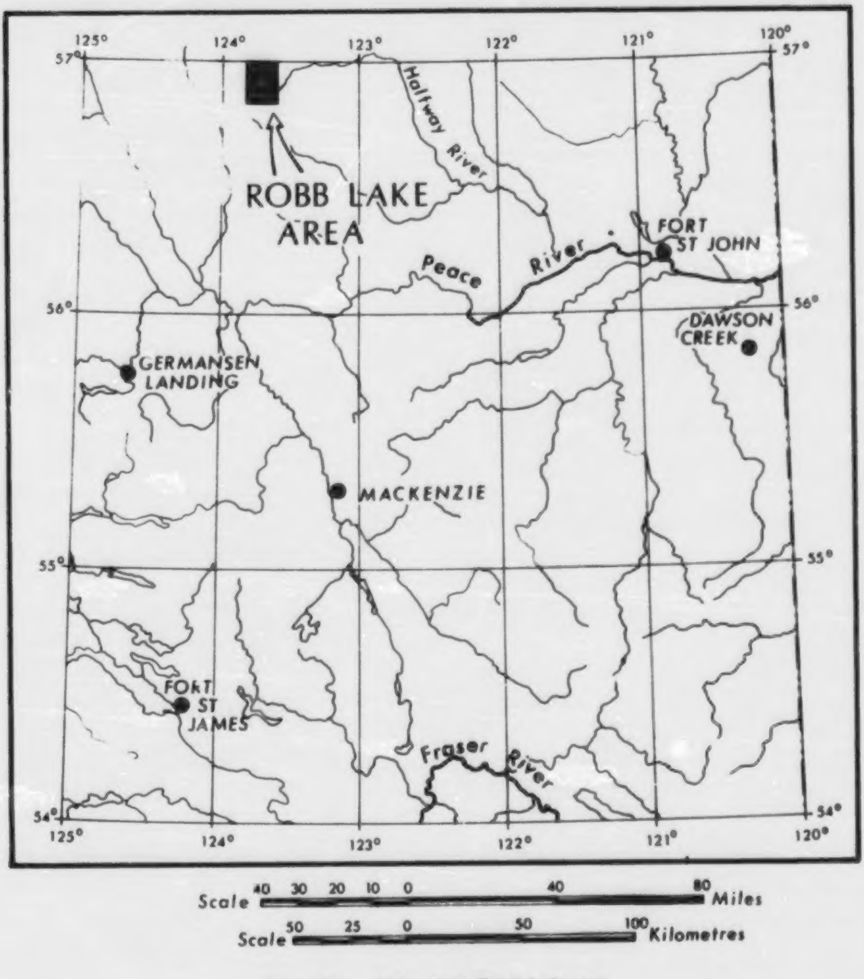

125°
124°
123°
122°
121°
120°
57°
56°
55°
54°
ROBB LAKE AREA
Halfway River
Peace River
FORT ST JOHN
DAWSON CREEK
GERMANSEN LANDING
MACKENZIE
FORT ST JAMES
Fraser River
Scale 40 30 20 10 0 40 80 Miles
Scale 50 25 0 50 100 Kilometres

Figure 60. Index map, Robb Lake area.

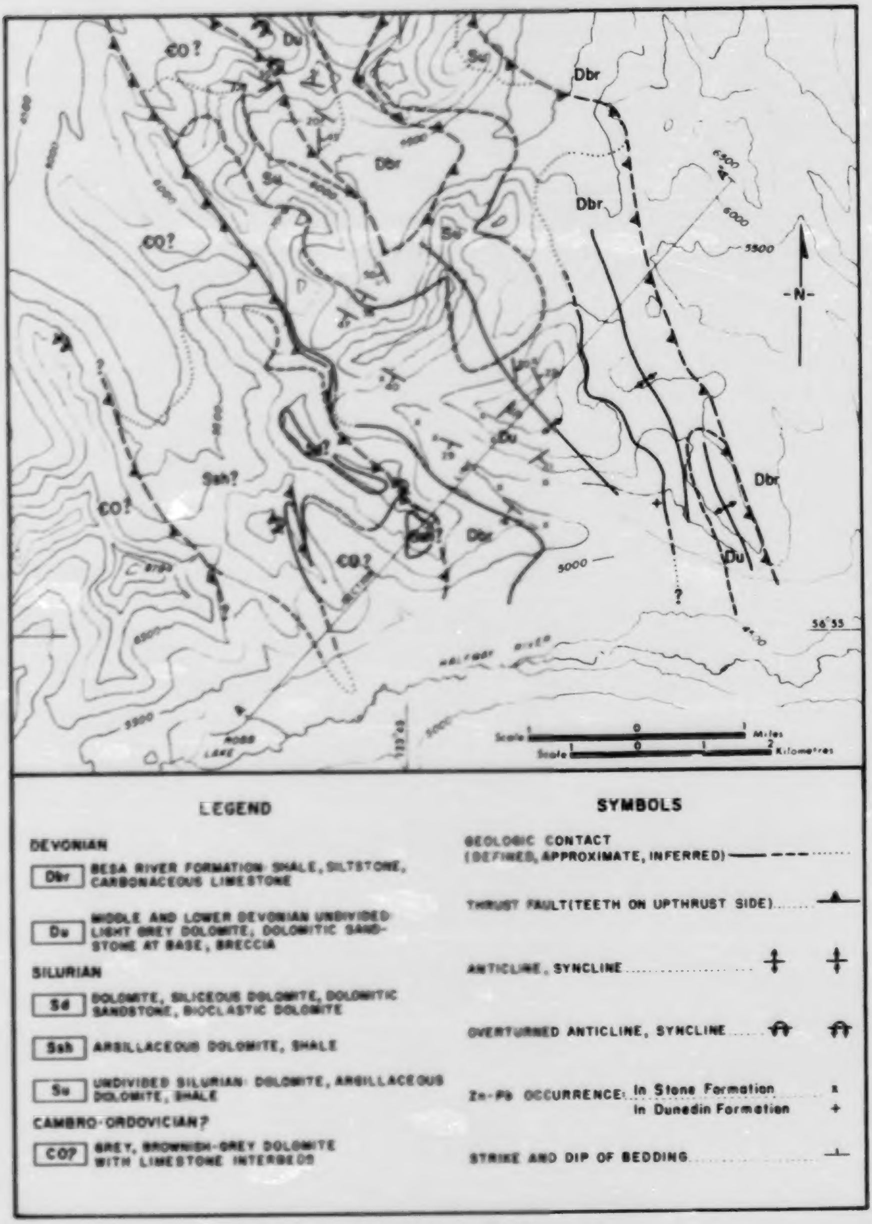
miogeoclinal carbonate rocks and shales exposed in a series of folded thrust slices (Irish, 1970). Zinc-lead sulphide occurrences near Robb Lake are contained within a massive dolostone of Middle Devonian age.

Rocks of Lower and Middle Devonian age in northeastern British Columbia and adjacent Alberta comprise a westerly thickened prism which undergoes a series of lateral (and vertical) facies changes across a shallow-water carbonate platform and into a deeper water time transgressive shale basin. Regionally the carbonate platform comprises three parts: a shoreline delineated by arenaceous rocks, a shallow-water and commonly barred carbonate shelf of variable width, and an outer barrier reef (carbonate front) which separates the shelf from the deeper water shale basin (Taylor, 1972). Variations within this framework include additional reef complexes, isolated or linked, on the carbonate shelf.

Northwest of Robb Lake, the Lower and Middle Devonian comprise a thick succession of calcarenite, dolostone, and limestone (with subordinate shale) representative of shoreline and shelf facies (Table 1); the Upper Devonian comprises a thick transgressive shale which covers most of the Lower and Middle Devonian carbonate platform (Table 1, Taylor and MacKenzie, 1970). The Lower Devonian *Muncho-McConnell Formation:* ...(is an) alternating medium and dark grey, finely crystalline dolomite that rests disconformably on the Silurian Nonda Formation... (Northford, *et al.*), and is overlain by the *Wokkpash Formation:* ...a 156 foot sequence of sandstone, dolomitic sandstone and argillaceous dolomite... (*op cit,* p. 7). The Middle Devonian comprises the *Stone Formation:* ...a sequence of light grey, finely and medium crystalline dolomite that overlies (unconformably) the Wokkpash Formation... (*op cit,* p. 9), and the *Dunedin Formation:* ...a uniform, dark grey, bedded limestone... (*op cit,* p. 12). The Upper Devonian comprises the *Besa River Formation,* a black shale containing thin impure limestone, chert, and siltstone beds in its upper part.

Table 1. Devonian Straigraphy of Northeastern British Columbia
(After Taylor and MacKenzie, 1970)

Age	Formation	Description
Late Devonian	Besa River Formation	shale
Middle Devonian	Dunedin Formation	bedded argillaceous limestone
	Stone Formation	massive crystalline dolostone
Early Devonian	Wokkpash Formation	orthoquartzite, sandy dolomite
	Muncho-McConnell Formation	finely crystalline dolomite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Du
Dbr
Sd
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Sh?
Ssh?
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6000
5500
5000
HALFWAY RIVER
ROBB LAKE
56°55
123°40
N
Scale 1 0 1 Miles
Scale 1 0 1 2 Kilometres
LEGEND
DEVONIAN
Dbr BESA RIVER FORMATION: SHALE, SILTSTONE, CARBONACEOUS LIMESTONE
Du MIDDLE AND LOWER DEVONIAN UNDIVIDED: LIGHT GREY DOLOMITE, DOLOMITIC SANDSTONE AT BASE, BRECCIA
SILURIAN
Sd DOLOMITE, SILICEOUS DOLOMITE, DOLOMITIC SANDSTONE, BIOCLASTIC DOLOMITE
Ssh ARGILLACEOUS DOLOMITE, SHALE
Su UNDIVIDED SILURIAN: DOLOMITE, ARGILLACEOUS DOLOMITE, SHALE
CAMBRO-ORDOVICIAN?
CO? GREY, BROWNISH-GREY DOLOMITE WITH LIMESTONE INTERBEDS
SYMBOLS
GEOLOGIC CONTACT (DEFINED, APPROXIMATE, INFERRED)
THRUST FAULT (TEETH ON UPTHRUST SIDE)
ANTICLINE, SYNCLINE
OVERTURNED ANTICLINE, SYNCLINE
Zn-Pb OCCURRENCE: In Stone Formation
In Dunedin Formation
STRIKE AND DIP OF BEDDING

Figure 61. Geological map, Robb Lake area.

Each of the Lower and Middle Devonian formations represent a cycle of platform carbonate deposition, and each has a westerly and northerly barrier reef: the Muncho-McConnell, Wokkpash, Stone, and Dunedin Barriers. Each cycle of deposition was ended by drowning of the existing reef front and concomitant transgression of the shale basin.

The Robb Lake area is located on or adjacent to the Pine Point front (Shekilie front) of Middle Devonian (Givetian ?) age which extends north and northeast from the western flanks of Alberta and Peace River Arches to Great Slave Lake (Griffin, 1965; Hriskevich, 1970; Taylor, 1972). This complex is an inner barrier reef which existed in part contemporaneously with the Dunedin Barrier (Taylor, 1972) exposed north of Liard River.

STRATIGRAPHY: Devonian rocks at Robb Lake are subdivided into four litho stratgraphic units (Table 2): basal orthoquartzite, Stone Formation, Dunedin Formation, and Besa River Formation.* The orthoquartzite is lithologically similar to the Wokkpash Formation but a correlation is not certain. The Muncho-McConnell Formation was not recognized.

Table 2. Generalized Devonian Lithostratigraphic Succession at Robb Lake

Age	Formation	Thickness (feet)	Description
Late Devonian	Besa River (Dbr)	?	shale with interbeds of siltstone and sandstone
Middle Devonian	Dunedin (Du)	190	carbonaceous dolostone with fossiliferous interbeds
Early Devonian	Stone (Du)	1,700	blocky crystalline stromatolite-bearing dolostone with orthoquartzite and sandy dolomite interbeds
	Basal ortho- quartzite (Du)	300	orthoquartzite with sandy dolomite interbeds

---

*Figure 61 was prepared on the basis of 1972 field data at which time subdivison of the carbonate succession was not made. Map unit Du comprises the basal orthoquartzite unit, and the Stone and Dunedin Formations.

Basal orthoquartzite unit is 249 feet thick and comprises a cliff-forming succession of light to medium grey orthoquartzites, sandy and silty dolostones, and desiccation (sharpstone) breccias. The base is marked by several feet of breccia consisting of irregular and tabular, very angular to subrounded clasts of sandy dolostone and dolostone up to 3 feet long set in a matrix of protoquartzite. Small and large-scale tabular crossbeds are common.

The *Stone Formation* is approximately 1,760 feet thick and comprises a massive, fine to medium crystalline grey stromatolite-bearing dolostone; interbeds of sandy and silty dolostone and orthoquartzite occur throughout the formation.

Dolomitization of stromatolitic limestone has produced a conspicuous and pervasive (in some parts) colour-laminated texture of alternating white and grey laminations which is apparently similar to 'zebra dolomite' and 'zebra-layering' in the Leadville district of Colorado and the Colville district of northeastern Washington state (Glossary of Geology, *Am. Geol. Institute,* 1973, p. 802). Dolomite beds with well-developed birds eye fabric are also common. This fabric refers to lenticular voids that are commonly filled with sparry carbonate and arranged in a laminar configuration. Birds eye fabric and stromatolites are common to shallow-water strand-line environments and zebra dolomites are commonly found associated with stratabound lead-zinc deposits. Quartz sand clasts in sandy dolostone and orthoquartzite are very well rounded, frosted, and some beds have a bimodal distribution. These characteristics are typical of sands which have been subjected to eolian processes.

The *Dunedin Formation*† comprises 190 feet of carbonaceous dolostone with very fossiliferous interbeds. The lower contact was not observed, however intense fracturing near the base may indicate presence of a bedding plane fault.

Hemispherical, tubular, and flat stromatoporoids are the most abundant fossils and commonly form thin biostromes. Ostracods, crinoid columals, brachiopods, and lag deposits of fish remains also occur. Sandy beds are not common, and quartz silt is a minor constitutent of the dolostone. The presence of numerous stromatoporoid biostromes in the Dunedin at Robb Lake is indicative of a shallow neritic environment of deposition.

The *Besa River Formation* overlies the Dunedin Formation conformably and interfingers with it over a 15-foot interval. It comprises a thick succession of brown and black siltstone and shale.

Dolostone, shale, siltstone, and sandstone of Cambro-Ordovician and Silurian ages are exposed in the western and northern part of the area mapped. In the north central part of the area, the Silurian (Su) comprises well-bedded, chert-bearing, and fossiliferous dolostone with orthoquartzite and sandstone interbeds. Ungraded turbidite sandstones with well-developed sole markings occur near the top of the section. Diagnostic Silurian fauna includes *Halysites.*

Originally it was thought two facies of Silurian rocks occur, shale overlain by dolostone, however this is no longer certain and map units Ssh and Sd may be Cambro-Ordovician age instead.

---

†Dunedin Formation was observed at one locality only, in the south-facing bowl in the right-central portion of the map-area. The apparent lack of Dunedin rocks elsewhere leaves the designation of Dbr to the sliver of shale along the western portion of the lower thrust panel in doubt.

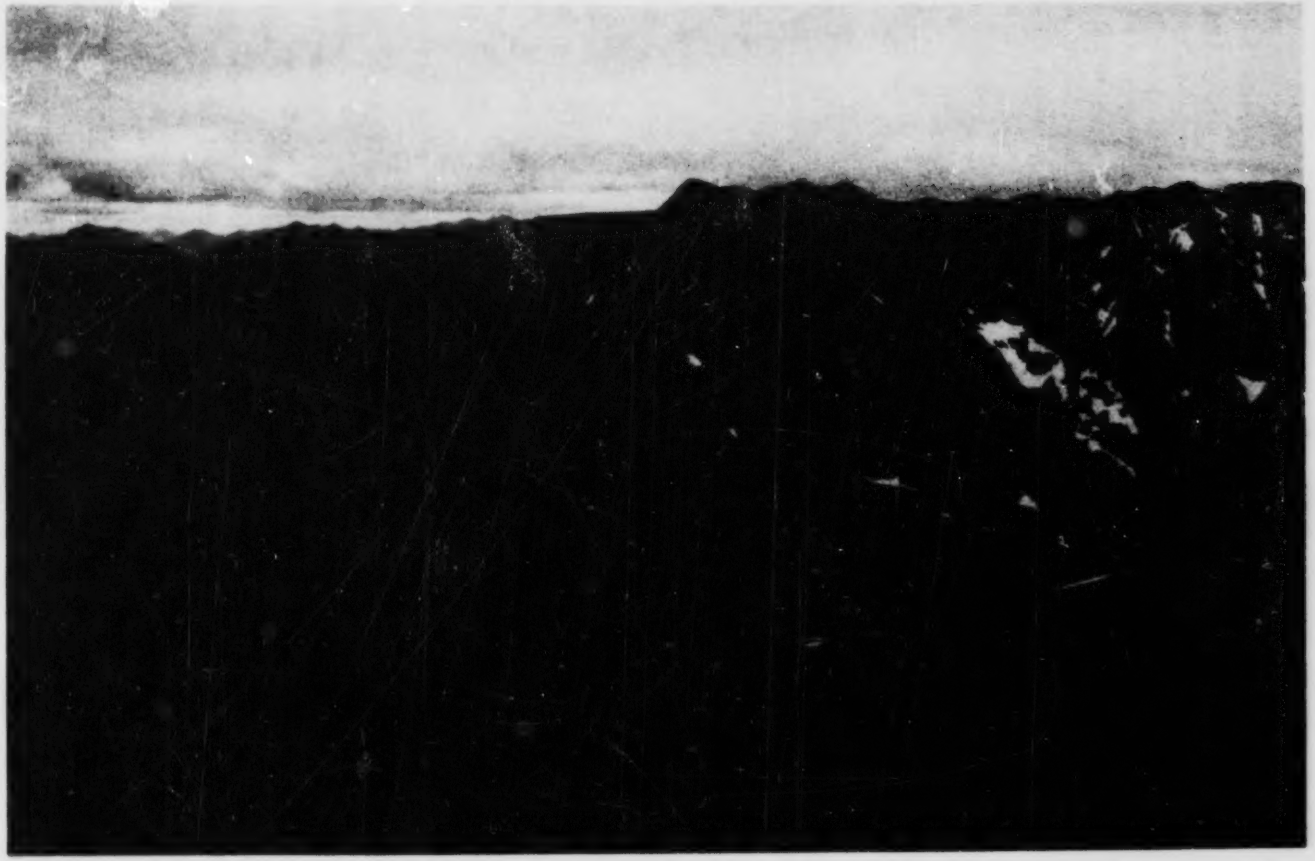


Plate XIV. Down-plunge view of major anticlinal fold in lower thrust panel, looking toward the southeast. Refer to Figure 61 for explanation of symbols.

Rocks of probable Cambro-Ordovician age include massive dense white, tan-weathering dolostone, and interbedded argillite and dolomite. Sandstone and orthoquartzite beds were also observed. The nature and distribution of these rocks were not studied in detail.

STRUCTURE: The map-area comprises two large thrust sheets. The lower sheet of Silurian and Devonian strata is folded into a broad anticline (Plate XIV) and thrust upon Besa River shales to the east; it is overthrust by a sheet of Silurian (?) and Cambro-Ordovician strata which may contain other thrust faults of lesser magnitude. The salient structural features are illustrated on Figure 62, a structure section oriented perpendicular to the axial orientation of the anticline and viewed from the southeast; map contacts were projected up and down plunge into the plane of section. Axial orientation of the anticline was calculated from a lower hemisphere plot of poles to bedding taken across the fold (Fig. 63).

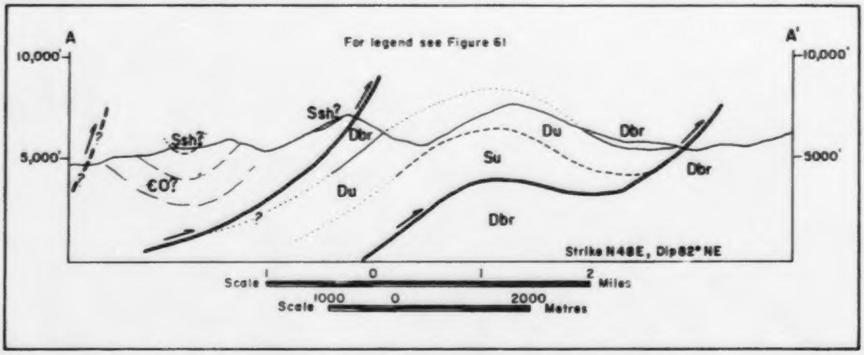


Figure 62. Structure along section A-A' on Figure 61.

SULPHIDE MINERALIZATION: Sulphide mineralization occurs principally within the Stone Formation where it is largely confined to breccias (Plate XVA). In most mineral showings, pale to medium brown sphalerite is the dominant mineral with much less galena and minor pyrite. The sulphides occur as rims around dolostone fragments and as large crystals and crystal aggregates within the sparry filling (Plate XVB). Pyrite, where present, occurs as thin fine-grained fragment coatings beneath sphalerite and hence possibly predates it depositionally. The large euhedral nature of many sphalerite crystals attests to the very porous conditions that must have existed at the time of sulphide deposition.

One sulphide occurrence is known in the Dunedin Formation (Fig. 61). Here, the mineralization is contained in narrow vertical and subvertical fractures filled with white sparry dolomite. Where these fractures crosscut porous features such as birds eye fabric, sphalerite and pyrite extend from the fracture into the porous area.

Most of the mineral showings found to date are concentrated in the western limb and crest of the anticline in the lower thrust sheet, however this may only reflect that the western limb is well exposed in contrast to the eastern.

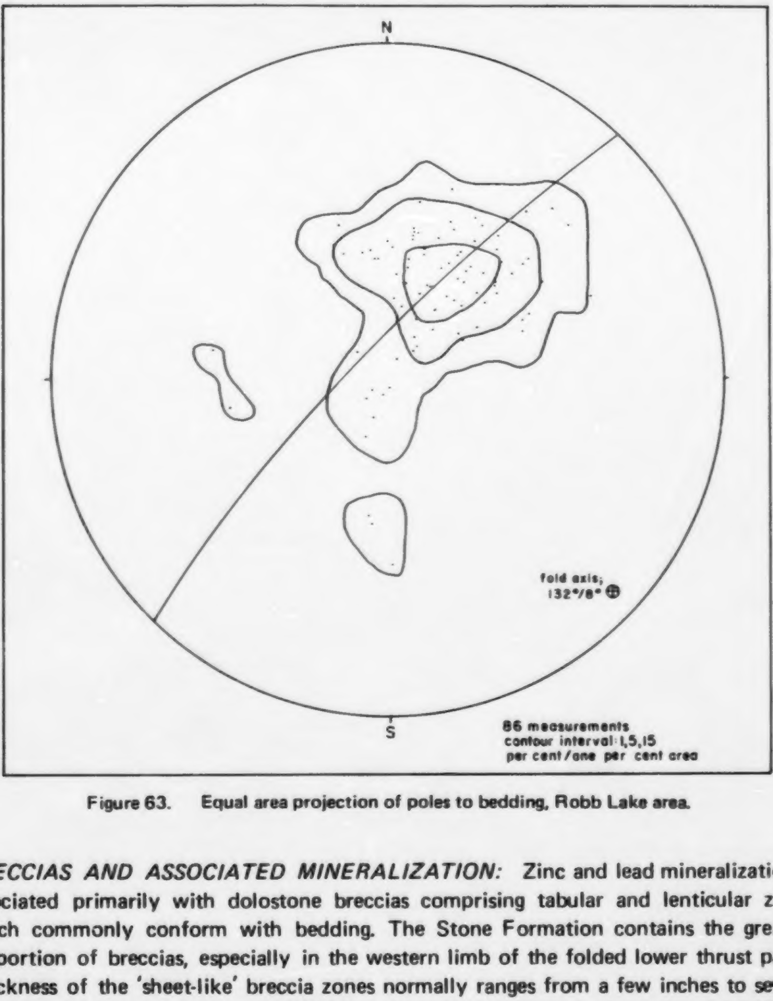


Figure 63. Equal area projection of poles to bedding, Robb Lake area.

BRECCIAS AND ASSOCIATED MINERALIZATION: Zinc and lead mineralization is associated primarily with dolostone breccias comprising tabular and lenticular zones which commonly conform with bedding. The Stone Formation contains the greatest proportion of breccias, especially in the western limb of the folded lower thrust panel. Thickness of the 'sheet-like' breccia zones normally ranges from a few inches to several tens of feet but may rarely exceed 150 feet. Lateral dimensions in the order of 1,000 feet are common. Margins of breccia zones vary from sharp to gradational. The sharp contacts appear undisturbed with few irregularities (Plate XVIIA): evidence of chemical or mineralogical alteration is lacking. Across gradational contacts there is a progressive outward decrease in the degree of brecciation which passes into a zone of rectilinear fracturing (Plate XVI). The distinction between zones of intense fracturing and breccia is often difficult to make. Adjacent beds appear little affected by presence of intercalated breccia zones. Commonly, a zone of breccia will cut obliquely across adjacent beds at a low angle and in a manner similar to bedding plane fractures (Plate XVIIB). Warping, slumping, stoping, and solution thinning of adjacent beds was not observed.

A unique discordant zone occurs on the north-northwest-facing slope in right-central part of the map-area where subhorizontal beds appear truncated by a subvertical east-west-trending breccia zone with steep poorly developed foliation.

Internally the breccias comprise grey dolostone fragments surrounded by white, medium to coarse crystalline spary dolomite (Plate XVA and XVB). Fragment size and composition vary; 1 to 5 centimetres is a common size range but clasts as small as a millimetre to ones several metres in breadth occur. Usually the internal texture and composition of fragments reflect those of the adjacent rocks. Character is also variable; closely packed aggregates of angular fragments are most common but may be interrupted by areas of grey crystalline 'patches' which float in the white dolomite (pseudobreccia). In the latter case it appears the fragments have been resorbed with only remnant cores remaining.

'Jigsaw puzzle' fabric of many breccia zones indicates there has been little displacement or transport of the fragments. Commonly, a fragment array can be visually reconstituted into a single mass with no loss of volume, and no angular discordances. In plan view, many breccia zones comprise beds which have been 'pulled apart' as a result of dilation in the bedding plane. Zones of dilation between the blocks are filled with smaller angular fragments which have fallen into the fracture (Plate XVIIB).

Origin of Breccias: A 'solution collapse' origin of the breccia zones has been proposed (Sangster, 1972; Thompson, 1973), however lack of supporting evidence leaves this assertion in doubt. Alternatively, textural and spatial relationships appear best explained in terms of 'tectonic dilation' as a result of deformation. Concordant 'sheet-like' geometry, 'pull-apart' and 'jigsaw puzzle' fabrics, angular uncorroded nature of many fragments, and evidence of only local displacement and transport support this hypothesis. Solution thinning of overlying or adjacent beds, argillite or carbonaceous mud residues, solution rounding of fragments, and cavern and channelway development — features typical of karst development and collapse structures — were not observed.

Paleozoic rocks in the Robb Lake area underwent deformation during the Tertiary Laramide orogenic event. Fracturing and brecciation of the sort described above probably occurred at that time. Localization of breccias within the Stone Formation is attributed to its homogeneous compositional nature and lack of layer anisotropy which did not allow localization of strain within incompetent beds. Instead, strain was accommodated by fracturing throughout the mass with dilation and 'pull apart' along some surfaces of preferred orientation. If the above assertion is correct, there is a significant time gap between age of mineralization which is contemporaneous with fracturing, and age of deposition (Devonian).

WORK DONE: Soil and silt geochemical surveys; geological mapping and prospecting; diamond drilling.

REFERENCES:

Griffin, D. L. (1965), The Devonian Slave Point, Beaverhill Lake, and Muskwa Formations of Northeastern British Columbia and Adjacent Areas, *B.C. Dept. of Mines & Pet. Res.*, Bull. 50, 90 pp.; Hriskevich, M. E. (1970), Middle Devonian Reef Production, Rainbow Area, Alberta, Canada, *Am. Assoc. of Pet. Geol.*, Bull., Vol. 54, No. 12, pp. 2260-2281; Irish, E.J.W. (1970), Halfway River Map-area, British Columbia, *Geol. Surv., Canada,* Paper 69-11, 154 pp.; Sangster, D. F. (1972), Geology of Canadian Lead and Zinc Deposits, Robb Lake, B.C., *Geol. Surv., Canada,* Paper 73-1, Report of Activities, Pt.

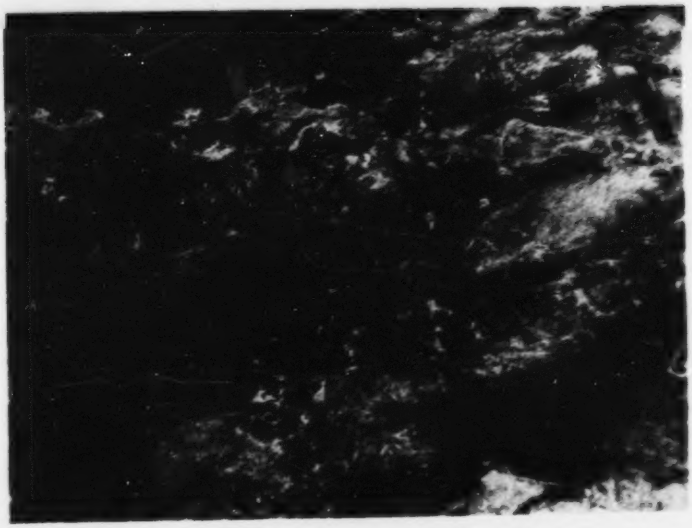


Plate XVA. Mineralized breccia zone within Stone Formation.

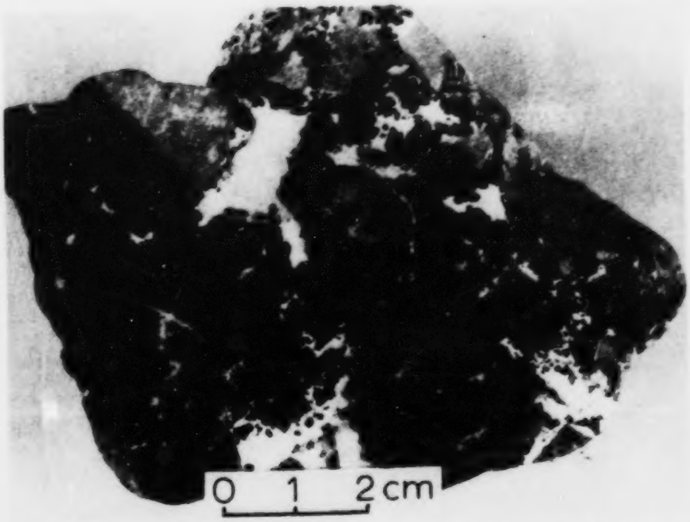


Plate XVB. Aggregates of large sphalerite crystals adjacent to dolostone fragments. Note pyrite adjacent to and relatively below sphalerite.

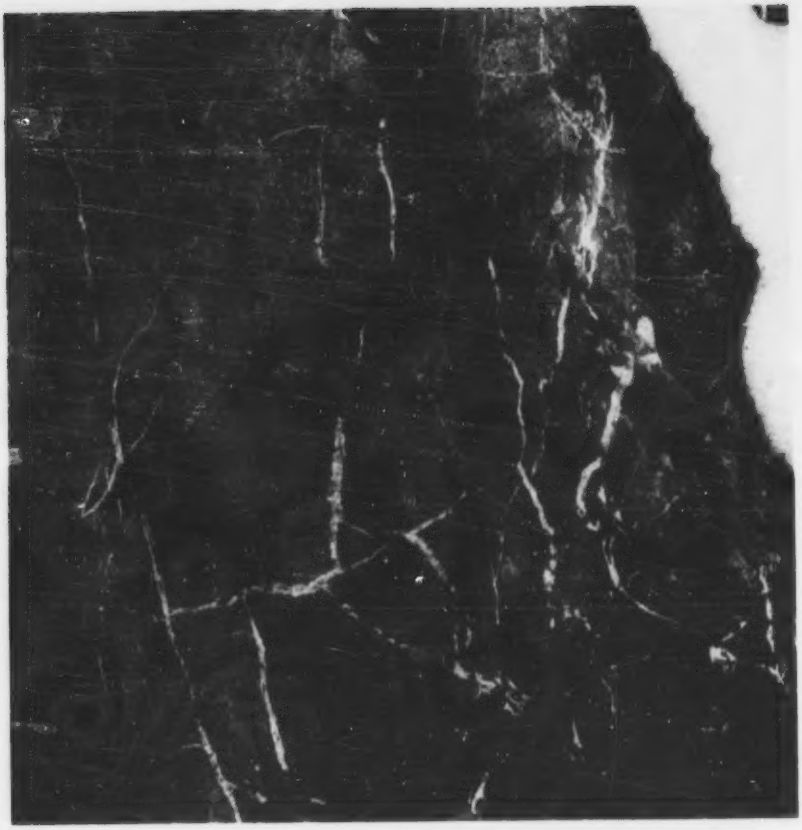


Plate XVI. Zone of rectilinear fracturing which grades laterally and vertically into breccia.

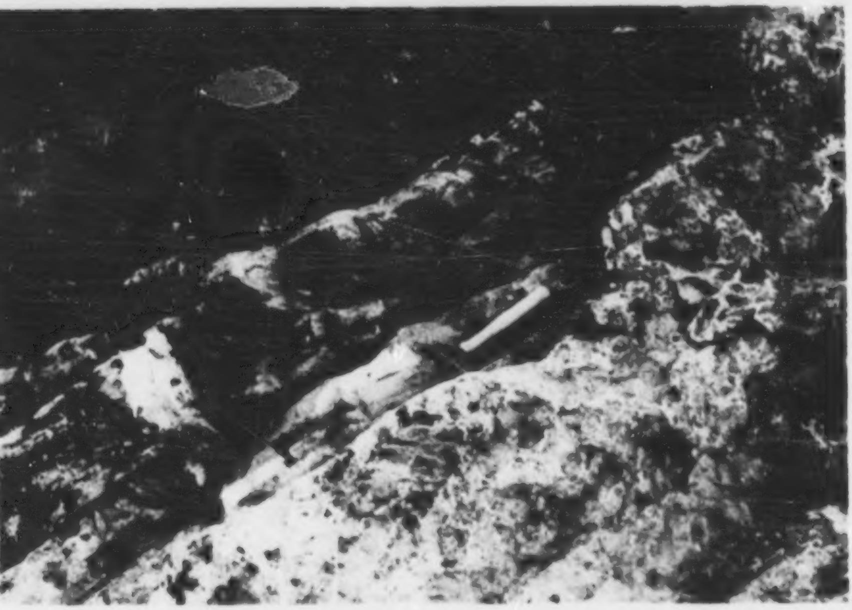


Plate XVIIA. Conformable breccia 'sheet' which, towards upper right, steps obliquely across overlying sandy dolomite beds.

Plate XVIIB. Separation of two large blocks with smaller rock fragments in zone of dilation. Note conformable outlines of walls of zone.

A, p. 129; Taylor, G. C. and MacKenzie, W. S. (1970), Devonian Stratigraphy of Northeastern British Columbia, *Geol. Surv., Canada*, Bull. 186, 62 pp.; Taylor, G. C. (1972), Theory of Carbonate to Shale facies fronts as indications of base metal mineralization put to test in Northern Rocky Mountains, *Northern Miner*, No. 30, p. 58; Thompson, R. I. (1973), Sedimentary Geology and Mineral Deposits of the Canadian Cordillera, *Geol. Assoc. Can.*, Abstract, Program and Abstracts of Cordilleran Section, p. 19.

CL (No. 65, Fig. E)

LOCATION: Lat. 56° 56'-57.5' Long. 123° 50'-52' (94B/13W)
LIARD M.D. Between 4,400 and 5,000 feet elevation 1 mile west of Mount Kenny, 5 miles northwest of Robb Lake, 135 miles northwest of Fort St. John.
CLAIMS: CL 1 to 32, 34 to 66.
ACCESS: By helicopter from Fort St. John, 135 miles.
OWNER: BUCKHORN MINES LTD., 1000, 1055 West Hastings Street, Vancouver 1.
WORK DONE: Geochemical soil survey, 329 samples covering CL 1-11, 16-22, 25-30, and 43-46, 51, 53.
REFERENCE: Assessment Report 4147.

DAVE, DOUG (No. 64, Fig. E)

LOCATION: Lat. 56° 58.7' - 57° 01' Long. 123° 50'-53.5' (94B/13W; 94G/4W)
LIARD M.D. Eight miles north of Robb Lake, 140 miles northwest of Fort St. John.
CLAIMS: DAVE 1 to 24, DOUG 1 to 36.
ACCESS: By helicopter from Fort St. John, 140 miles.
OWNER: BUCKHORN MINES LTD., 1000, 1055 West Hastings Street, Vancouver 1.
WORK DONE: Geochemical soil survey, 638 samples.
REFERENCE: Assessment Report 4148.

ALFA, BETA (No. 24, Fig. E)

LOCATION: Lat. 56° 49.1'-52.1' Long. 123° 40.8'-45.5' (94B/13)
LIARD M.D. Between 4,600 and 7,600 feet elevation on Calnan Creek, 6 miles southwest of the junction of Calnan Creek and the Halfway River, 120 miles northwest of Fort St. John.
CLAIMS: ALFA 1 to 36, 41, BETA 1 to 42, GAMMA 1 to 40.
ACCESS: By helicopter from Mile 147 on the Alaska Highway, 46 miles.
OWNERS: Milestone Mines Limited and Pan Ocean Oil Ltd.
OPERATOR: PAN OCEAN OIL LTD., 1050 Three Calgary Place, 355 Fourth Avenue SW., Calgary, Alta.
DESCRIPTION: The claims comprise dolomite, sandstone, limestone, shale, and cherty

dolomite of Ordovician and Silurian age of the Middle Devonian Dunedin and Besa River Formations respectively.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet and geochemical soil, talus, and rock chip survey, 372 samples covering all claims.

REFERENCES: Assessment Reports 4145, 4146.

FORT GRAHAME 94C

RAVEN (No. 10, Fig. E)

LOCATION: Lat. 56° 29.5′ Long. 125° 55′ (94C/5W, 12W)
OMINECA M.D. Between 5,000 and 5,500 feet elevation 8.5 miles northwest of Aiken Lake, approximately 2.5 miles west of Lay Creek.

CLAIMS: RAVEN 1 to 10, 17 to 21.

ACCESS: By road from Germansen Landing, 105 miles.

OWNER: UNION MINIERE EXPLORATIONS AND MINING CORPORATION LIMITED, 200, 4299 Canada Way, Burnaby.

DESCRIPTION: Pyritized volcanic rocks are intruded by a northwest-trending diorite dyke.

WORK DONE: Surface diamond drilling, two holes totalling 995 feet on Raven 5 and 20.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 61.

PALACE (No. 15, Fig. E)

LOCATION: Lat. 56° 16′ Long. 125° 32′ (94C/5E)
OMINECA M.D. At approximately 4,000 feet elevation on the south bank of Matetlo Creek, 3.5 miles from its mouth.

CLAIMS: PALACE 1 to 6.

ACCESS: By helicopter from the Omineca road at Aiken Lake, 12 miles.

OWNER: UNION MINIERE EXPLORATIONS AND MINING CORPORATION LIMITED, 200, 4299 Canada Way, Burnaby.

DESCRIPTION: A small granitic stock intrudes Takla Group volcanic rocks. Disseminated chalcopyrite occurs locally in volcanic rocks.

WORK DONE: Geochemical soil and silt survey, 121 samples covering all claims.

BURN (No. 13, Fig. E)

LOCATION: Lat. 56° 27′ Long. 125° 30° (94C/5E, 6W)
OMINECA M.D. Three miles south of the Swannell River, 9 miles northeast of Aiken Lake.

CLAIMS: BURN 1 to 20.

ACCESS: By road and helicopter from Fort St. John, approximately 220 miles.

OWNER: SEREM LTD., 914, 850 West Hastings Street, Vancouver 1.

(94C/6E)

METALS: Silver, lead, zinc.

WORK DONE: Surface geological mapping, 1 inch equals one-half mile; electromagnetic test; geochemical stream sediment survey.

SWAN (No. 14, Fig. E)

LOCATION: Lat. 56° 25′ Long. 125° 26′ (94C/6E)
OMINECA M.D. Three and one-half miles north of the Mesilinka River, 10 miles east of Aiken Lake.

CLAIMS: SWAN 1 to 6.

ACCESS: By road and helicopter from Fort St. James, approximately 220 miles.

OWNER: SEREM LTD., 914, 850 West Hastings Street, Vancouver 1.

METALS: Silver, lead, zinc.

WORK DONE: Surface geological mapping, 1 inch equals one-half mile; electromagnetic test; geochemical stream sediment survey.

RAIN (No. 12, Fig. E)

LOCATION: Lat. 56° 30′ Long. 125° 35′ (94C/12E, 5E)
OMINECA M.D. One and one-half miles south of the Swannell River, 2 miles southwest of Mount Lay.

CLAIMS: RAIN 1 to 10.

ACCESS: By road and helicopter from Fort St. John, approximately 220 miles.

OWNER: SEREM LTD., 914, 850 West Hastings Street, Vancouver 1.

METALS: Silver, lead, zinc.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet and 1 inch equals one-half mile; electromagnetic test; reconnaissance geochemical survey.

McCONNELL CREEK 94D

FRED, BOBO, MARG (No. 9, Fig. E)

LOCATION: Lat. 56° 03′ Long. 126° 15.5′ (94D/1W)
OMINECA M.D. Between 4,500 and 5,000 feet elevation in the Cariboo Heart Range, 3 miles southeast of Nanitsch Lake.

CLAIMS: FRED, BOBO, MARG, MONA, etc., totalling 90.

ACCESS: By floatplane from Smithers, 100 miles.

OWNER: NORTHSTAR COPPER MINES LTD., 1214 Eastview Road, North Vancouver.

METAL: Copper.

DESCRIPTION: Chalcocite, digenite, bornite with minor chalcopyrite and native copper occur in andesite porphyry and shale.

(94D/2W)

WORK DONE: Surface diamond drilling, nine holes totalling 2,508 feet on Mona claims.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 186.

BEAR (No. 61, Fig. E)

LOCATION: Lat. 56° 05.5′-07.5′ Long. 126° 50′-53.5′ (94D/2W)
OMINECA M.D. At approximately 5,500 feet elevation west of Tsaytut Spur, west side of Bear Lake, 90 miles north of Smithers.

CLAIMS: BEAR 1 to 54.

ACCESS: By helicopter from Smithers, 90 miles.

OWNER: CANADIAN NICKEL COMPANY LIMITED, Box 890, Thompson, Man.

DESCRIPTION: A quartz monzonite stock related to the Kastberg Intrusions intrudes volcanic rocks of the Hazelton Group.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet.

REFERENCE: *Geol. Surv., Canada*, Map 962A, McConnell Creek.

IN (No 3, Fig. E)

LOCATION: Lat. 56° 13.3′-15′ Long. 127° 16′-20′ (94D/3W)
OMINECA M.D. Between 3,000 and 4,500 feet elevation 3 miles west of Squingula River, 16 miles northwest of Bear Lake.

CLAIMS: IN 1 to 38.

ACCESS: By aircraft from Smithers, 100 miles.

OWNER: CANADIAN SUPERIOR EXPLORATION LIMITED, Box 100, Smithers.

METALS: Copper, molybdenum.

DESCRIPTION: Porphyry plugs, dykes, and sills intrude Mesozoic volcanic rocks.

WORK DONE: Magnetometer survey, 12 line-miles covering In 1-9, 24, 25, 27, 28, and 30; surface diamond drilling, three holes totalling 341 feet on In 4.

REFERENCE: Assessment Report 3868.

DAY (No. 38, Fig. E)

LOCATION: Lat. 56° 30.0′ Long. 126° 47.1′ (94D/7W, 10W)
OMINECA M.D. At approximately 4,600 feet elevation on the Sustut River, about 21 miles north-northeast of Bear Lake.

CLAIMS: DAY 1 to 20.

ACCESS: By helicopter from Moose Valley, 15 miles.

OWNER: WESFROB MINES LIMITED, 500, 1112 West Pender Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Copper occurs in quartz veins in Takla volcanic rocks.

WORK DONE: Surface diamond drilling, two holes totalling 100 feet on Day 4.

RINGO (No. 5, Fig. E)

LOCATION: Lat. 56° 25' Long. 126° 06' (94D/8E)
OMINECA M.D. Between 5,000 and 7,500 feet elevation at the head of Dortatelle and Kliyul Creeks, 15 miles southeast of Sustut Lake.

CLAIMS: RINGO 1 to 15, 17 to 22; 23 and 24 Fractions, NORLEN 7 to 12; 13 and 14 Fractions, TUMBLE 3 and 4.

ACCESS: By helicopter from Aiken Lake, 12 miles.

OPERATORS: DOUGLAS STELLING and STELLAC EXPLORATION LTD., Box 933, Fort St. James.

METALS: Molybdenum, copper.

DESCRIPTION: Molybdenite occurs within felsite veins and to a lesser extent within quartz and pegmatite veins near the contact of the Takla volcanic rocks and the Hogem batholith.

WORK DONE: Surface geological mapping, 1 inch equals 500 feet covering all claims; geochemical soil surveys, 225 samples covering Ringo 1, 3, 5, 7, Norlen 10, 12, and 14 Fraction, and Ringo 17, 19 to 22.

REFERENCES: Assessment Reports 3839, 4092.

KLI (No. 36, Fig. E)

LOCATION: Lat. 56° 26.5' Long. 126° 05' (94D/8E)
OMINECA M.D. Between 4,100 and 5,000 feet elevation on Kliyul Creek, 12 miles west of Aiken Lake.

CLAIMS: KLI 1 to 4, 32 to 35.

ACCESS: By helicopter from Aiken Lake, 12 miles.

OWNER: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Andesite flows of the Takla Group are intruded by quartz monzonite dykes. Silicified shears and fractures in andesites near contact are well mineralized with pyrite and minor chalcopyrite.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet covering KLI 5-48; geochemical silt survey, 73 samples covering KLI 1-48.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp, 61, 62; Assessment Report 3977.

SHELL (CROY) (No. 33, Fig. E)

LOCATION: Lat. 56° 28.5' Long. 126° 02' (94D/8E)
OMINECA M.D. At approximately 6,000 feet elevation 2.5 miles north of Kliyul Creek, 11 miles northwest of Aiken Lake.

CLAIMS: CROY 1 to 21.

ACCESS: By helicopter from Aiken Lake, 11 miles.

OWNER: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.

METALS: Copper, gold, silver.

(94D/10E)

DESCRIPTION: Faulted and fractured volcanic flows are intruded by granites. Mineralization consists of massive veins of chalcopyrite, pyrite, and pyrrhotite. Extensive epidote alteration is present.

WORK DONE: Surface diamond drilling, four holes totalling 3,902 feet on Croy 1, 2, and 4.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, pp. 186, 187.

SUSTUT COPPER (No. 39, Fig. E)

LOCATION: Lat. 56° 35.8′ Long. 126° 41.5′ (94D/10E)
OMINECA M.D. The centre of the claim group, which extends for 20 miles in a northwesterly direction, is situated west of the Sustut River, 4 miles west of Sustut Peak and 9 miles west of the north end of Sustut Lake.

CLAIMS: SUSTUT 1 to 129, WILLOW 1 to 58, WILL 1 to 20.

ACCESS: By helicopter from Aiken Lake, 40 miles.

OWNER: WESFROB MINES LIMITED, 500, 1112 West Pender Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Copper mineralization, including native copper, bornite, and chalcopyrite, occurs in Upper Triassic Takla Group volcanic rocks.

WORK DONE: Topography mapped; surface diamond drilling, 28 holes totalling 8,500 feet on Sustut 1 to 8.

REFERENCES: *Geol. Surv., Canada,* Mem. 251, 1948, pp. 15-17; Assessment Report 4198.

THOR (No. 55, Fig. E)

LOCATION: Lat. 56° 53.4′ Long. 126° 37.7′ (94D/15E)
OMINECA M.D. At approximately 6,000 feet elevation 2.5 miles northeast of the north end of Thorne Lake, at the headwaters of Attichika Creek.

CLAIMS: THOR 1 to 36.

ACCESS: By floatplane from Smithers, 142 miles.

OWNER: KERR ADDISON MINES LIMITED, 405, 1112 West Pender Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: Sparce chalcopyrite and molybdenite occur on fractures and in quartz veins in pyritized and silicified andesites, hornblende andesites, and dacites near a syenite dyke.

WORK DONE: Hand trenching, 350 lineal feet on Thor 1, 3, and 4; surface diamond drilling, five holes totalling 345 feet on Thor 1 and 3.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 62.

TOODOGGONE RIVER 94E

ATTYCELLEY (No. 8, Fig. E)

LOCATION: Lat. 57° 05.5' Long. 126° 43' (94E/2E)
OMINECA M.D. Between 5,000 and 6,000 feet elevation 7 miles east of the north end of Thutade Lake, southwest of Attycelley Creek.
CLAIMS: ATTYCELLEY 7 to 10.
ACCESS: By floatplane from Smithers, 165 miles.
OWNER: KENNCO EXPLORATIONS, (WESTERN) LIMITED, 730, 505 Burrard Street, Vancouver 1.
METALS: Lead, zinc, copper.
DESCRIPTION: Galena, sphalerite, and chalcopyrite occur in quartz veins.
WORK DONE: Geochemical soil survey during 1971.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1969, p. 103; Assessment Report 3694.

FIRESTEEL (No. 35, Fig. E)

LOCATION: Lat. 57° 04' Long. 126° 55' (94E/2W)
OMINECA M.D. At approximately 4,000 feet elevation 2 miles north-northwest from the north end of Thutade Lake, 160 miles north of Smithers.
CLAIMS: FIRE 1 to 10, BRULE 3 and 4, UBBLE 7 to 11.
ACCESS: By floatplane from Smithers, 160 miles.
OPERATOR: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.
METALS: Silver, lead, zinc, copper.
DESCRIPTION: Limestones and volcanic rocks underlie the claim area. Silver, lead, zinc, and copper mineralization occurs in quartz veins paralleling bedding in limestone. Zinc carbonate occurs in a recent conglomerate.
WORK DONE: Surface geological mapping, 1 inch equals 200 feet; electromagnetic survey, 14 line-miles, gravity survey, 6 line-miles; and geochemical soil survey, 866 samples covering all claims.
REFERENCE: *Minister of Mines, B.C.,* Ann. Rept., 1968, p. 148.

SAUNDERS (No. 4, Fig. E)

LOCATION: Lat. 57° 17'-21' Long. 127° 03'-17' (94E/6)
OMINECA M.D. Between elevations of 4,000 and 7,000 feet 17 miles northwest of Thutade Lake.
CLAIMS: SAUNDERS, LAWYERS, KODAH, totalling 549.
ACCESS: By aircraft from Smithers, 170 miles.
OWNER: KENNCO EXPLORATIONS, (WESTERN) LIMITED, 730, 505 Burrard Street, Vancouver 1.
METALS: Gold, silver, copper.

(94E/6W)

DESCRIPTION: The claims are underlain by Toodoggone porphyritic volcanic rocks.

WORK DONE: Geochemical survey covering Lawyers 1, 3-6, 9-18, 21-30, 45-58, 60, 63-66, 93-97, 99, 131-140, 151-160, 177-179; magnetometer survey covering Kodah 4, 6, 8, 10-16, 19-32.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 63-65 and p. 70; Assessment Reports 3836, 3837, 3841.

PUT, HUMP (No. 56, Fig. E)

LOCATION: Lat. 57° 27'-30' Long. 127° 20'-29' (94E/6W)
LIARD M.D. At approximately 5,000 feet elevation on Alberts Hump, between Moyez and Metsantan Creeks.

CLAIMS: PUT 1 to 38, HUMP 1 to 16, 21 to 52, 69 to 72, 77 to 80, 85 to 88, 90, 92 to 100.

ACCESS: By helicopter from Watson Lake, 200 miles.

OWNER: SUMAC MINES LTD., 1022, 510 West Hastings Street, Vancouver 2.

METALS: Copper, molybdenum.

DESCRIPTION: The property consists of andesites, tuffs, and agglomerates, strongly altered in part. Mineralization appears to be associated with veins containing chalcopyrite, pyrite, and quartz.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Put 2, 7, 8, 13, 21, 23, 25 and Hump 1, 3, 5, 7, 9, 10-14, 22, 24, 26, 29-34, 37-39, 41, 45, 70, 77, 78; geochemical soil survey, 354 samples covering Put 2-13, 15, 17, 34, 36 and Hump 1-14, 21-26, 29-34, 37, 38, 45, 70, 77, 78, 85, 86.

REFERENCE: Assessment Report 4060.

PIT (No. 67, Fig. E)

LOCATION: Lat. 57° 26.1' Long. 127° 09.9' (94E/6E)
LIARD M.D. At approximately 5,900 feet elevation between McClair and Moosehorn Creeks, 13 miles southwest of Chukachida Lake.

CLAIMS: PIT 41 to 60, 77 to 96, 159 to 202.

ACCESS: By helicopter from Watson Lake, 200 miles.

OWNER: SUMAC MINES LTD., 1022, 510 West Hastings Street, Vancouver 2.

METALS: Silver, lead, zinc.

DESCRIPTION: Rocks on the property comprise andesites, tuffs, and agglomerates dipping northwesterly at 10 to 15 degrees. Mineralization appears to be associated with steeply dipping veins, containing carbonates and quartz, as well as pyrite, sphalerite, and galena.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 400 feet covering Pit 47, 49, 51, 159-164, 167-170, 193-198; magnetometer survey, 11.5 line-miles and self-potential survey, 5.3 line-miles covering Pit 159-162, 164, 171-173, 179-182, 191, 197; geochemical soil survey, 188 samples covering same claims as magnetometer survey; trenching, 1,730 feet on Pit 159, 160, and 171.

REFERENCES: Assessment Reports 3831, 3833, 4063.

WAS (No. 58, Fig. E)

LOCATION: Lat. 57° 28.5' Long. 127° 12.5' (94E/6E)
LIARD M.D. Between 4,400 and 5,900 feet elevation east of Moosehorn Creek, 10 miles southwest of Chukachida Lake.

CLAIMS: WAS 1 to 32, PIT 69 to 76, JUG 1 to 12, SUM 3 to 20.

ACCESS: By helicopter from Watson Lake, 200 miles.

OWNER: SUMAC MINES LTD., 1022, 510 West Hastings Street, Vancouver 2.

METALS: Copper, silver, lead, zinc.

DESCRIPTION: Rocks on the property mainly comprise andesites, tuffs, and agglomerates which strike northwesterly and dip northeasterly at 35 to 45 degrees. A few basaltic dykes cut andesitic formation. Mineralization appears to lie in a series of fractured or sheared zones trending northwesterly and dipping 50 degrees to the southwest. They contain galena, sphalerite, and pyrite.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 400 feet covering Was 5-11, 13, 15, 20-30, 32; magnetometer survey, 9.1 line-miles and induced polarization survey, 7.6 line-miles covering Was 5, 7, 20-32 and Jug 7, 8, 10; geochemical soil survey, 306 samples covering same claims as magnetometer survey; trenching, 350 feet on Was 23.

REFERENCES: Assessment Reports 3832, 3834, 4061, 4062, 4064.

CHAPPELLE (No. 63, Fig. E)

LOCATION: Lat. 57° 16.8' Long. 127° 06.6' (94E/6E)
OMINECA M.D. Between elevations of 4,000 and 7,000 feet 17 miles northwest of Thutade Lake.

CLAIMS: CHAPPELLE, totalling 262.

ACCESS: From Smithers by aircraft, 170 miles.

OWNER: KENNCO EXPLORATIONS, (WESTERN) LIMITED, 730, 505 Burrard Street, Vancouver 1 (optioned to Conwest Exploration Company Limited in late 1972).

METALS: Gold, silver, copper.

DESCRIPTION: A quartz vein near the central part of the property cuts Takla volcanic rocks and contains high grade gold and silver values.

WORK DONE: Two thousand feet of hydraulic trenching on the main vein; five other veins in the vicinity of the camp were exposed and sampled. Some rock geochemistry was done and 500 soil and 150 silt samples were collected and analysed.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 65-70; Assessment Report 4066.

SOM (No. 37, Fig. E)

LOCATION: Lat. 57° 20.3'-22.3' Long. 127° 00'-02.5' (94E/6E)
OMINECA M.D. Between 4,000 and 6,500 feet elevation on Saunders Creek, 4 miles southwest of Toodoggone Lake.

(94E/7W)

CLAIMS: NE 1 to 24, 26 to 49, 51, 59 to 61, 99 to 106, GO 90, 92, 94, 96, 98, 100, 102 to 114, Ri 101 to 103.

ACCESS: By helicopter from Eddontenajon, 120 miles.

OWNER: DENISON MINES LIMITED, 4 King Street West, Toronto, Ont.

METALS: Gold, silver, copper.

DESCRIPTION: Claims are underlain principally by Takla and Toodoggone volcanic rocks which have been intruded by small monzonite plugs.

WORK DONE: Claims mapped from airphotographs; surface geological mapping, 1 inch equals one-half mile covering 82 claims; geochemical survey, 744 soil samples, 197 rock chip samples, and 45 silt samples covering 82 claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 63, 64; Assessment Report 4091.

BLACK (No. 41, Fig. E)

LOCATION: Lat. 57° 17.5'-19' Long. 126° 51.4'-53.8' (94E/7W)
OMINECA M.D. Between 5,000 and 6,200 feet elevation 3 miles south of Mount Graves, 17 miles north of Thutade Lake.

CLAIMS: BLACK 1 to 45.

ACCESS: By aircraft from Smithers, 180 miles.

OWNER: KENNCO EXPLORATIONS, (WESTERN) LIMITED, 730, 505 Burrard Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Minor malachite and azurite occur in syenite and syenite porphyry.

WORK DONE: Geological mapping, 1 inch equals 400 feet and geochemical survey covering Black 43-45.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 71; Assessment Report 3987.

MD (No. 20, Fig. E)

LOCATION: Lat. 57° 17.5'-20° Long. 126° 00'-07' (94E/8E)
OMINECA M.D. Between 2,900 and 3,100 feet elevation 9 miles south of Mount Bower, 16 miles east of the Finlay River.

CLAIMS: Forty-four MD, twelve MS, seven HH.

ACCESS: By aircraft from Smithers, 270 miles.

OWNERS: NITHEX EXPLORATION AND DEVELOPMENT LTD., Box 73, Endako and DAVID MINERALS LTD., 355, 555 Burrard Street, Vancouver 1.

DESCRIPTION: The claims are underlain by limestone.

WORK DONE: Geochemical soil survey, 100 samples covering MS 1-12; trenching, 70 feet on MS 3 and 5; surface diamond drilling, one hole totalling 150 feet on MS 3.

WEST (No. 6, Fig. E)

LOCATION: Lat. 57° 55.5' Long. 127° 28.7' (94E/14W)
LIARD M.D. At approximately 5,000 feet elevation 13 miles north-northeast of Mount Albert Dease.

(94F/16E)

CLAIMS: WEST 1 to 32, MACK 7 to 20, 1 Fraction, EARL 1 to 8, 1 to 3 Fractions.

ACCESS: By fixed-wing aircraft and helicopter from Watson Lake, 150 miles.

OWNER: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1 (Earl claims optioned from Plateau Minerals Limited).

METAL: Copper.

DESCRIPTION: Chalcopyrite occurs in shear zones in quartz monzonite.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet and reconnaissance silt survey, 67 samples covering all claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, pp. 61, 62; Assessment Report 3835.

WARE 94F

DEAN (No. 2, Fig. E)

LOCATION: Lat. 57° 58.5′ - 58° 00′ Long. 124° 02′-05′ (94F/16E)
LIARD M.D. Between 3,580 and 5,000 feet elevation on the southern branch of Bathto Creek, 78 miles southwest of Fort Nelson.

CLAIMS: DEAN 1 to 31.

ACCESS: By aircraft from Fort Nelson to Kluachesi Lake, then by pack trail for 4 miles.

OPERATOR: GOWGANDA SILVER MINES LTD., c/o D. Carlson, 34 Adelaide Street West, Toronto, Ont.

WORK DONE: Geological mapping and geochemical soil survey, 243 samples, during 1971.

REFERENCE: Assessment Report 3470.

TRUTCH 94G

TYE (No. 28, Fig. E)

LOCATION: Lat. 57° 00′-03′ Long. 123° 44.5′-47′ (94G/4)
LIARD M.D. Eight miles north of Robb Lake.

CLAIMS: TYE 1 to 100.

ACCESS: By floatplane from Mackenzie, 120 miles.

OWNER: GENERAL RESOURCES LTD., 713, 744 West Hastings Street, Vancouver 1.

DESCRIPTION: Ordovician and Silurian carbonate rocks, shale, and arenite are exposed in an imbricate thrust plate which overlies Devonian strata to the east.

WORK DONE: Surface geological mapping, 1:25,000 covering all claims.

REFERENCE: Assessment Report 4149.

RB, DEV, JUNE (No. 17, Fig. E)

LOCATION: Lat. 57° 08.5'-14.5' Long. 123° 43'-48' (94G/4)
LIARD M.D. At approximately 6,000 feet elevation on Mount Bertha and the Sikanni Chief River, 120 miles northwest of Fort St. John.
CLAIMS: One hundred and nine RB, twenty-seven DEV, ninety-two JUNE.
ACCESS: By aircraft from Fort St. John, 120 miles.
OWNER: CANADIAN SUPERIOR EXPLORATION LIMITED, 2201, 1177 West Hastings Street, Vancouver 1.
METALS: Lead, zinc.
DESCRIPTION: Minor sphalerite and galena occur in dolomite and limestone of Middle Devonian age (Stone and Dunedin Formations).
WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet; geochemical survey, 1,044 soil samples and 1,144 rock samples covering all claims.
REFERENCE: Assessment Report 4090.

MT, HAR (No. 18, Fig. E)

LOCATION: Lat. 57° 13'-15.5' Long. 123° 44'-47' (94G/4, 5)
LIARD M.D. Between 4,800 and 5,500 feet elevation on Cranswick Lake, 6 miles southeast of Redfern Lake.
CLAIMS: MT 1 to 45, HAR 1 to 40, 50, 51.
ACCESS: By floatplane from Fort Nelson, 120 miles.
OWNER: ADASTRAL MINING CORPORATION LTD., 8th Floor, 900 West Hastings Street, Vancouver 1.
DESCRIPTION: Thrust slices of Middle Devonian limestone (Dunedin Formation) and shale (Besa River Formation) are exposed in a series of northerly trending anticlines.
WORK DONE: Surface geological mapping, 1 inch equals one-half mile; geochemical silt survey, 28 samples covering all claims.

BRIN (No. 27, Fig. E)

LOCATION: Lat. 56° 15' - 57° 15' Long. 123° 25'-55'
(94B/5E, 6W, 12E, 13W; 94G/4W)
Report on this property in section 94B/5E.

DAVE, DOUG (No. 64, Fig. E)

LOCATION: Lat. 56° 58.7' - 57° 01' Long. 123° 50'-53.5' (94B/13W; 94G/4W)
Report on this property in section 94B/13W.

NORM (No. 29, Fig. E)

LOCATION: Lat. 57° 02'-04.8' Long. 123° 49.2'-50.3' (94G/4W)
LIARD M.D. At approximately 5,500 feet elevation 5.5 miles west of Robb Lake, 8 miles south of the Sikanni Chief River, about 120 miles

(94G/4W)

due north of Mackenzie.

CLAIMS: NORM 1 to 50.

ACCESS: By helicopter from Mackenzie, 120 miles.

OWNER: RAYORE ENTERPRISES LTD., 420 Howe Street, Vancouver 1.

DESCRIPTION: Limestone, dolomite, and calcareous shale of probable Devonian age are exposed in folded thrust slices.

WORK DONE: Reconnaissance geological and geochemical examination.

CHIEF (No. 62, Fig. E)

LOCATION: Lat. 57° 07.8'-12.5' Long. 123° 48'-53.5' (94G/4W)
LIARD M.D. At approximately 4,500 feet elevation straddling the Sikanni Chief River, 6 miles southwest of Cranswick Lake and 10 to 12 miles southeast of Sikanni Chief Lake.

CLAIMS: CHIEF 1 to 80, AWG 1 to 24.

ACCESS: By aircraft from Mackenzie, 150 miles.

OWNERS: NATION LAKE MINES LIMITED, BELL MOLYBDENUM MINES LIMITED, and HAZELTON JOINT VENTURE, c/o 3196 Westmount Place, West Vancouver.

DESCRIPTION: Dolomite and limestone of probable Middle Devonian age are overlain by carbonaceous shale.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Chief claims; geochemical soil survey, 300 samples covering Chief claims.

SEL (No. 16, Fig. E)

LOCATION: Lat. 57° 15.5'-18.3' Long. 123° 45'-47' (94G/5W)
LIARD M.D. At approximately 4,000 feet elevation immediately north of Cranswick Lake, 5 miles southeast of Redfern Lake, 130 miles northwest of Fort St. John.

CLAIMS: SEL 1 to 50.

ACCESS: By helicopter from Pink Mountain, 45 miles.

OWNER: McINTYRE PORCUPINE MINES LIMITED, 1003, 409 Granville Street, Vancouver 2.

DESCRIPTION: Thrust slices of Middle Devonian carbonate rocks and shale are exposed in a series of northerly trending folds.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet and geochemical soil and silt survey, 50 samples.

RUST (No. 57, Fig. E)

LOCATION: Lat. 57° 29'-33' Long. 123° 50'-53.5' (94G/12W, 5W)
LIARD M.D. Between Keily and Richards Creeks, 40 miles southwest of Trutch on the Alaska Highway, 140 miles northwest of Fort St. John.

CLAIMS: RUST 1 to 112, 117, 118.

(94G/12W)

ACCESS: By helicopter from Fort St. John, 140 miles.

OWNER: Tyee Lake Resources Ltd.

OPERATORS: SHEBA COPPER MINES LIMITED, MOUNTAIN PASS MINES LTD., and TYEE LAKE RESOURCES LTD., c/o 1930, 1055 West Hastings Street, Vancouver 1.

WORK DONE: Preliminary geological examination.

RIC, HEW (No. 43, Fig. E)

LOCATION: Lat. 57° 33'-36.5' Long. 123° 51' - 124° 00.5' (94G/12W)
LIARD M.D. At approximately 4,500 feet elevation near Richards Creek, 10 miles south of Prophet River, 35 miles west of Mile 180 on the Alaska Highway.

CLAIMS: RIC 1 to 108, HEW 1 to 216.

ACCESS: By floatplane and helicopter from Mackenzie, 160 miles.

OWNER: COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 5.

METAL: Zinc.

DESCRIPTION: Sphalerite occurs in collapse breccias of the Middle Devonian Stone Formation.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet and 1 inch equals 40 feet covering Ric claims; geochemical soil survey covering Ric claims; surface diamond drilling, eight holes totalling 1,082 feet on Ric claims.

FAITH (No. 44, Fig. E)

LOCATION: Lat. 57° 35'-36.5' Long. 123° 58'-59' (94G/12W)
LIARD M.D. At approximately 6,000 feet elevation between the head of Richards Creek and the Prophet River, 35 miles west of Mile 190 on the Alaska Highway.

CLAIMS: FAITH 1 to 28.

ACCESS: By helicopter from Pink Mountain, 64 miles.

OWNER: ECSTALL MINING LIMITED, 701, 1281 West Georgia Street, Vancouver 5.

METAL: Lead.

DESCRIPTION: Galena occurs in barite pods contained within the Middle Devonian Stone Formation.

WORK DONE: Reconnaissance surface geological mapping, 1 inch equals 1,000 feet and reconnaissance silt and soil survey, 15 samples covering Faith 1-28.

REFERENCE: Assessment Report 4299.

CAY (No. 42, Fig. E)

LOCATION: Lat. 57° 41.5'-45' Long. 123° 55'-56.5' (94G/12W)
LIARD M.D. Two miles north of the Prophet River, 10 miles south of the Muskwa River, 170 miles north-northwest of Mackenzie.

(94K/1E)

CLAIMS: CAY 1 to 52.

ACCESS: By floatplane and helicopter from Mackenzie, 170 miles.

OWNER: COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 5.

METALS: Lead, zinc, silver.

DESCRIPTION: Lead-zinc mineralization occurs in brecciated limestone of the Dunedin Formation.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet and 1 inch equals 40 feet; geochemical soil survey.

REFERENCE: Assessment Report 4201.

TUCHODI LAKES 94K

DOG (No. 30, Fig. E)

LOCATION: Lat. 58° 06.5'-10' Long. 124° 08'-13' (94K/1E)
LIARD M.D. On Dead Dog Creek 7 miles south of Tuchodi River.

CLAIMS: DOG 1 to 204.

ACCESS: About 75 miles by helicopter from Fort Nelson.

OWNER: COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 3.

METALS: Lead, zinc.

DESCRIPTION: Galena and sphalerite occur in brecciated zones in Dunedin limestone.

WORK DONE: Soil samples were collected for geochemical analysis.

REFERENCE: Assessment Report 4202.

A (No. 19, Fig. E)

LOCATION: Lat. 58° 01' Long. 124° 54' (94K/2W)
LIARD M.D. At elevation 6,000 feet 14 miles southwest of the southernmost part of Tuchodi Lakes and 7 miles west of Tuchodi River.

CLAIMS: A 1 to 20.

ACCESS: Sixty miles by helicopter from Mile 442, Alaska Highway or 100 miles by helicopter from Fort Nelson.

OPERATORS: CORDERO MINING COMPANY, 8th Street SW., Calgary, Alta. and SUN OIL COMPANY, 503 North Central Expressway, Richardson, Texas.

METALS: Lead, zinc.

DESCRIPTION: Galena and sphalerite occur in dolomite of Cambrian age and in argillite and quartzite of Precambrian age.

WORK DONE: The claims were mapped geologically and 79 soil and stream sediment samples were taken for geochemical analysis.

MARGE (No. 7, Fig. E)

LOCATION: Lat. 58° 28.5' Long. 125° 20.5' (94K/6W)
LIARD M.D. Between elevations of 4,500 and 7,500 feet 2 miles

(94K/7E, 8W, 9W, 10E)
northwest of Mount Roosevelt, on the north side of Delano Creek.

CLAIMS: MARGE 1 to 20.

ACCESS: By Churchill Copper Corporation Ltd.'s road from the Alaska Highway.

OPERATOR: VALLEX MINES LTD., 404, 540 Burrard Street, Vancouver 1.

WORK DONE: Ground magnetmometer survey covering 12.5 line miles.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 89; Assessment Report 3773.

CTV, CBC, HOPE, DODO (No. 32, Fig. E)

LOCATION: Lat. 58° 16.5'-31' Long. 124° 15.5'-31.5'
(94K/7E, 8W, 9W, 10E)
LIARD M.D. At approximately 5,000 feet elevation on the north slope of Mount Mary Henry, on the Tetsa River, 14 miles southwest of the Alaska Highway.

CLAIMS: CTV, CBC, HOPE, DODO, approximately 290.

ACCESS: By helicopter from Summit Lake, 12 miles distant.

OWNER: ECSTALL MINING LIMITED, 701, 1281 West Georgia Street, Vancouver 5.

METAL: Lead.

DESCRIPTION: The claims cover the outcrop of the Middle and Late Devonian Stone, Dunedin, and Besa River Formations. Several small occurrences of sphalerite and galena with associated barite and fluorite occur in the Dunedin Formation.

WORK DONE: Reconnaissance geology was mapped and 381 silt and soil samples were taken for geochemical analysis.

REFERENCE: Assessment Report 4300.

EAGLE MINE (No. 53, Fig. E)

LOCATION: Lat. 58° 33.1' Long. 125° 26.5' (94K/11W)
LIARD M.D. Between 4,500 and 6,500 feet elevation at the head of Cariboo Creek, the south branch of Yedhe Creek.

CLAIMS: EAGLE, BONANZA, LOIS, etc., totalling 429.

ACCESS: By road 20.5 miles from Mile 442 on the Alaska Highway.

OWNER: DAVIS-KEAYS MINING CO. LTD., 504, 850 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Steeply dipping, northeasterly striking quartz carbonate veins are mineralized with chalcopyrite.

WORK DONE: Ten diamond-drill holes totalling 9,108 feet were drilled on the Eagle and Bonanza claim groups.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, pp. 76-78.

BOB, RIM, MAD (No. 34, Fig. E)

LOCATION: Lat. 58° 31.5′ Long. 125° 33.0′ (94K/12E)
LIARD M.D. On the south side of Yedhe Creek at elevations of 6,000 to 7,500 feet, 7 miles west of Yedhe Mountain.

CLAIMS: BOB, RIM, MAD, ANN, STR, GEO, totalling 116.

ACCESS: By road south from Mile 442 on the Alaska Highway.

OWNER: COPPER KEAYS MINING LTD., 505, 850 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Quartz carbonate veins are mineralized with chalcopyrite.

WORK DONE: Seven holes totalling 2,233 feet were diamond drilled on the Ann 17 and 18 claims.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, 78-80.

KECHIKA 94L

TUCHO (No. 1, Fig. E)

LOCATION: Lat. 58° 16.8′ Long. 127° 57′ (94L/5W)
LIARD M.D. One and one-half miles south of Tucho River, 6 miles southwest of Tucho Lake.

CLAIMS: TUCHO, totalling 16.

ACCESS: By aircraft from Watson Lake, 130 miles.

OPERATOR: CORDILLERAN ENGINEERING LTD., 1418, 355 Burrard Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Copper mineralization occurs disseminated and in fracture veinlets in a heavily altered augite porphyry.

WORK DONE: An induced polarization and resistivity survey during 1971 covering Tucho 1-3, 11, 13, 19, 20, and 22.

REFERENCE: Assessment Report 3499.

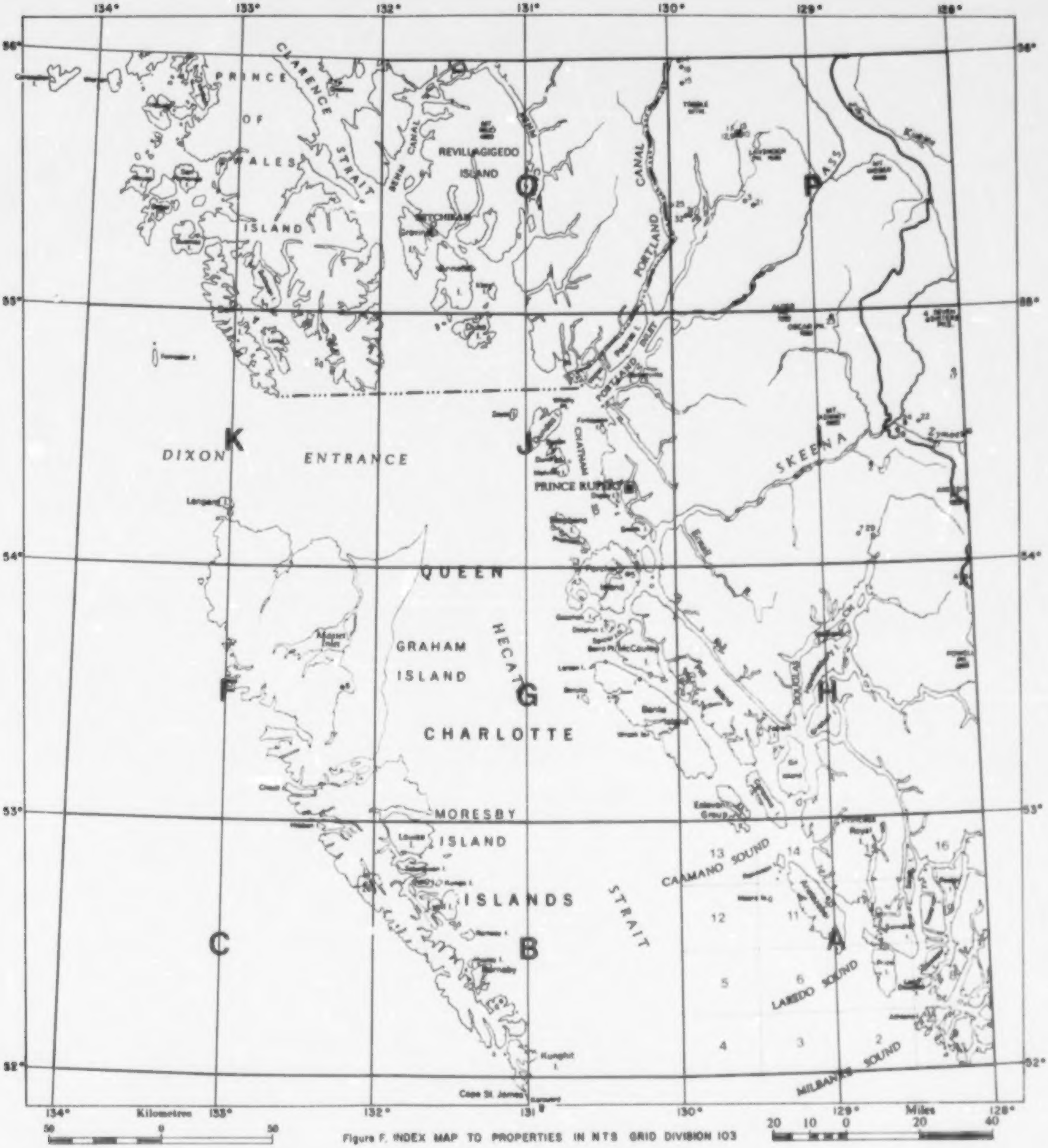

134°
133°
132°
131°
130°
129°
128°
56°
55°
54°
53°
52°
PRINCE OF WALES ISLAND
CLARENCE STRAIT
BEHM CANAL
REVILLAGIGEDO ISLAND
KETCHIKAN
PORTLAND CANAL
PORTLAND INLET
NASS
O
P
K
J
DIXON ENTRANCE
CHATHAM
PRINCE RUPERT
SKEENA
Zymoetz
Kispiox
Langara I.
QUEEN
GRAHAM ISLAND
HECATE
CHARLOTTE
F
G
H
Masset Inlet
Banks
DOUGLAS
Estevan Group
MORESBY ISLAND
ISLANDS
Louise I.
STRAIT
CAAMANO SOUND
Princess Royal
C
B
A
13
14
16
12
11
5
6
4
3
2
LAREDO SOUND
MILBANKE SOUND
Kunghit I.
Cape St. James
Kilometres
50
0
50
Miles
20
10
0
20
40

Figure F. INDEX MAP TO PROPERTIES IN NTS GRID DIVISION 103

KEY TO PROPERTIES ON INDEX MAP, FIGURE F.

1. BAN, page 498.
2. LADY LUCK, page 499.
3. LIME, page 506.
4. REGA, JACKAL, MAG, NIILO, page 502.
5. BLUE JAY, page 498.
6. JESSIE, ADONIS, page 494.
7. BOWBYES, page 498.
8. BABE, page 497.
9. RED POINT, page 507.
10. KITSOL, page 506.
11. SURPRISE, page 508.
12. DOLLY VARDEN, page 507.
13. MUSKETEER, page 508.
14. LITTLE JOE, GYPSY, page 509.
15. DOMINION, page 509.
16. NORTHWEST, page 500.
17. WB, page 500.
18. BLACK HILL, NELLIE, BLUE GROUSE, page 510.
19. GARNET, page 497.
21. BRITISH COLUMBIA MOLYBDENUM MINE, page 504.
22. KDL, page 501.
23. HOPE SILVER, page 501.
24. CROESUS, page 500.
25. MAPLE BAY (OUTSIDER) MINE, page 502.
26. TASU MINE, page 494.
27. PORPH, page 499.
28. TERRACE CALCIUM PRODUCTS LTD. QUARRY, page 603.
29. DISTRICT OF KITIMAT QUARRY, page 582.
30. LAREDO LIMESTONE QUARRY, page 602.
31. RED WING, page 503.
32. CD, CU, page 504.

WEST CENTRAL BRITISH COLUMBIA
(NTS Division 103 Figure F)

MORESBY ISLAND 103B, C

JESSIE, ADONIS (No. 6, Fig. F)

LOCATION: Lat. 52° 17.4' Long. 131° 11' (103B/6E)
SKEENA M.D. Between elevations of 500 and 1,200 feet 1 mile east of the south end of Harriet Harbour.

CLAIMS: Mineral Leases M-105 (JESSIE, Lot 1861), M-2 (ADONIS, Lot 1865), M-37 (HOT PUNCH, Lot 1976 and IRON DUKE, Lot 1977) plus 10 Crown-granted claims and 61 recorded claims.

ACCESS: By floatplane or boat from Sandspit, 71 miles.

ONWER: JEDWAY IRON ORE LIMITED, 2000, 1055 West Hastings Street, Vancouver 1.

METAL: Iron.

DESCRIPTION: The Jessie magnetite skarn orebody occurred near the contact of the Kunga limestone and Karmutsen basalts with a diorite pluton. The orebody was mined to its economic limit and closed in 1968.

WORK DONE: Early in 1972, a soil sampling programme was conducted over the adjacent property in search of copper occurrences. Trenching, totalling 12,260 cubic feet, was done on the Limestone and Jessie claims.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1968, p. 70; *B.C. Dept. of Mines & Pet. Res.*, Bull. 54, pp. 198-203, Assessment Report 3602.

TASU MINE (No. 26, Fig. F)

By B. M. Dudas

LOCATION: Lat. 52° 45.5' Long. 132° 03' (103C/16E)
SKEENA M.D. On the south side of Tasu Sound, Moresby Island, extending from sea-level to 3,000 feet elevation.

CLAIMS: Twenty-one Crown-granted and 83 located claims. The key claims are: BLUEBIRD, ELIZABETH, TASSOO, WARWICK, and WESTJACK.

ACCESS: By pontoon-equipped aircraft or power boat from Sandspit. Local freight is handled by coastal freighters and barges from Vancouver and Queen Charlotte City.

OWNER: WESFROB MINES LIMITED, 504, 1112 West Pender Street, Vancouver 1; mine office, Tasu.

METALS: Iron, copper (production shown on Table I).

DESCRIPTION:

The essential structure is a folded and tilted panel of stratified rocks surrounded and underlain in part by the northern termination of the San Christoval batholith. The stratified succession includes the upper part of the Karmutsen Formation and the three members of the Kunga Formation. Only the two limestone members are closely involved in the ore zones. The stratified panel was repeatedly intruded by igneous rocks from its

Plate XVIII. Aerial view of the Tasu mine, Gowing Island with Tasu townsite and causeway to the mine in foreground, concentrator and plant at middle right, and 3 Zone pit at top left. The 'Gap,' the entrance from the Pacific Ocean to Tasu Sound, is at top right (October 1972).

initial formation to late in the geological history of the area. First, Karmutsen basalts were cut by minor related sills. Next, a complex laccolith of diorite porphyry of considerable importance was emplaced principally between the Karmutsen and the Kunga Formations. Then the San Christoval batholith was emplaced, followed by skarnification and mineralization. Finally two volumetrically important post-ore dyke swarms, the earlier andesitic and the later basaltic, were intruded. The magnetite ore and associated skarn very largely are found in a stratiform zone some 200 feet thick above the top of the Karmutsen Formation, replacing massive limestone and diorite porphyry (*B.C. Dept. of Mines & Pet. Res.,* Bull. 54, p. 184).

WORK DONE:

The magnetite and chalcopyrite orebodies are mined in three open pits, on a two-shift, six-day schedule. Equipment used in the open pits is: one electric BE-150B shovel, one diesel BE-88B shovel, one 988 Caterpillar loader, two D-8 Caterpillar tractors, two electric BE-40R drills, two airtracs, and six Caterpillar 969-B off-highway ore trucks.

The 3 zone pit is the upper part of the mine and its lowest working floor is at 915 feet above sea level. The working faces are 35 feet high but the final pit wall is made up of two bench heights (70 feet) and a berm configuration, giving an overall pit wall slope of 50 degrees. Throughout the 3 zone pit pre-shear blasting is done at 18-inch centres, resulting in good stable final pit walls. Mining has been continuous in the 3 zone pit since 1967.

In the 2 zone pit mining commenced during the year at an overall pit wall slope of 65 degrees. In this pit, three bench heights and a berm will make up the final pit wall configuration. The first continuous pit wall of 105 feet was established during the year after encouraging results of the 1971 tests and rock mechanics studies. Despite minor wedge failures near the surface of the 'high wall,' (1,050 feet elevation), indications are that the wall will be stable at lower elevations.

The 1 zone pit comprises the lowest workings at the mine, the pit floor being at 220 feet above sea level.

The ore from 3 zone pit and 2 zone pit is dumped at the respective pit floors into an ore-pass system which serves as an ore pocket as well. There are two chutes under the ore passes in the 650 level haulage adit. From the haulage adit the ore is transported in a single 50-ton rail car to the main ore pocket above the underground crushing chamber. The ore from the 1 zone pit is hauled with trucks to the main ore pocket.

The total production for the year from the three pits was 1,232,364 tons of ore with a waste:ore ratio of .57:1 (cubic yards per ton). The average daily production was 8,000 tons of ore.

The crusher, cobbing plant, and concentrator operated on a two-shift, six-day weekly schedule producing 648,065 tons of sinter and pellet-feed iron concentrate and copper concentrate.

The production was temporarily suspended between June 26 and August 24 because of labour disputes and shipping difficulties caused by the Japanese dock strikes.

There has been no new major equipment addition or installation during the year. Underground development and exploration was halted in 1971 and was not resumed in 1972.

The company maintains Tasu townsite on Gowing Island, connected by a causeway to the mine area. Modern single-family houses, town-houses, and apartments are available for married personnel. Two modern single-men's residences are available for single personnel. A medical doctor and a full-time nurse are residing in the townsite. A well-equipped hospital, a school to grade 11, and a recreational complex with a modern swimming pool are maintained by the company.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1967, pp. 54-56; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 101; 1971, p. 110; *B.C. Dept. of Mines & Pet. Res.,* Bull. 54, pp. 183-189.

GARNET (No. 19, Fig. F)

By D. M. Dudas

LOCATION: Lat. 52° 46′ Long. 132° 01.2′ (103C/16E)
SKEENA M.D. Between 100 and 1,200 feet elevation on a peninsula between Fairfax and Botany Inlets in Tasu Sound, Moresby Island.

CLAIMS: GARNET 1 to 4, 5 Fraction, 6 to 12, 14 to 58, RUBY 1 to 4.

ACCESS: Three miles by motorboat from Tasu or 30 miles by pontoon-equipped aircraft from Sandspit.

OWNER: Moresby Mines Limited.

OPERATOR: IMPERIAL OIL LIMITED, 500 Sixth Avenue SW., Calgary, Alta.

METALS: Copper, molybdenum (iron, zinc).

DESCRIPTION: Magnetite, chalcopyrite, and sphalerite occur in small skarn bodies and veins near the contact of the Kunga limestone and Karmutsen basalts with hornblende diorite and quartz diorite of the San Christoval batholith. These plutonic rocks have a variable fracture stockwork containing quartz veinlets with chalcopyrite and molybdenite that form the main target of exploration in recent years.

WORK DONE: Ten diamond-drill holes totalling 2,132 feet were drilled. In addition, surface geological mapping and soil sampling were done.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 110; *B.C. Dept. of Mines & Pet. Res.,* Bull. 54, pp. 189-191.

GRAHAM ISLAND 103F and part of 103G

BABE (No. 8, Fig. F)

LOCATION: Lat. 53° 31.5′ Long. 132° 13.0′ (103F/9E)
SKEENA M.D. Between 300 and 700 feet elevation on the north side of Yakoun River, 11 miles south of Port Clements, central Graham Island.

CLAIMS: BABE 1 to 32, RIC 1 to 12, RIC 20 to 26 Fractions.

ACCESS: By logging road from Queen Charlotte City, 26 miles.

OPERATOR: COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 5.

METALS: Gold, mercury.

(103G/9W)

WORK DONE: Low-grade gold values are found in rhyolite breccias of the Tertiary Masset Formation near contact with the Cretaceous Queen Charlotte Group.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Babe 1-29; geochemicalwsoilwsurvey, 106 samples covering Babe 5, 7, 9, 10; trenching, approximately 300 feet (26 text pits) on Babe 5, 7, 9, 10, 12; surface diamond drilling, nine holes totalling 1,642 feet on Babe 5, 7, 9, and 10.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 111, 112.

BAN (No. 1, Fig. F)

LOCATION: Lat. 53° 33'-34.5' Long. 130° 14'-17' (103G/9W)
SKEENA M.D. On the northeast coast of Banks Island.

CLAIMS: BAN, totalling 48.

ACCESS: By boat or floatplane from Prince Rupert, 50 miles.

OWNER: QUESTED MINING CORPORATION LTD., 808, 850 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: Chalcopyrite, molybdenite, and bornite occur as disseminations and fracture fillings in the contact zone between marble and granitic intrusive rocks.

WORK DONE: Line-cutting and geological and geochemicalwsurveys during 1971 covering Ban 1 and 2.

REFERENCE: Assessment Report 3465.

BLUE JAY (No. 5, Fig. F)

LOCATION: Lat. 53°'57.6' Long. 130° 20' (103G/16W)
SKEENA M.D. On Porcher Island at the head of Porcher Inlet, 25 miles south of Prince Rupert.

CLAIMS: BLUE JAY 1 to 8.

ACCESS: By plane or boat from Prince Rupert, 25 miles.

OWNER: FIVE STAR PETROLEUM & MINES LTD., 9918 – 109th Street, Edmonton, Alta.

METAL: Molybdenum.

DESCRIPTION: Molybdenite occurs in quartz veins in granitic sills.

WORK DONE: Magnetometer survey covering Blue Jay 1-4.

REFERENCE: Assessment Report 3838.

TERRACE 103I

BOWBYES (No. 7, Fig. F) By B. M. Dudas

LOCATION: Lat. 54° 06' Long. 128° 45' (103I/2)
SKEENA M.D. At 2,500 feet elevation on the eastern slopes of Mount

Clague, about 3 miles westerly from the Kitimat bridge.

CLAIMS: BOWBYES 1 to 16, JOHN 1 to 8.

ACCESS: By 2 miles of trail from Eurocan logging road west of Kitimat.

OWNER: BOWBYES MINES LTD., 1767 Ingledew Street, Prince Geroge.

METALS: Copper, iron.

DESCRIPTION: Copper and iron minerals occur in chlorite schists, skarn, and siliceous volcanic rocks.

WORK DONE: During the year the Caterpillar trail was completed leading to the main showing. A number of small trenches was drilled and blasted and about 15 tons of sulphide minerals was stockpiled.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 72; 1971, p. 112.

LADY LUCK No. 2, Fig. F)

LOCATION: Lat. 54° 23' Long. 128° 40' (103I/7E)
SKEENA M.D. At an elevation of 8,000 feet on the east slope of Mount Johnstone.

CLAIMS: LADY LUCK 1 to 40, GABE 1 to 36, KENAD 1 to 38, MAYNERS FORTUNE 1 to 8, LUCKY FORTUNE 1 to 8, 17 to 20.

ACCESS: By road from Terrace, 22 miles.

OWNER: CREE LAKE MINING LTD., 2608 London House, 505 Fourth Avenue SW., Calgary, Alta.

METALS: Copper, molybdenum, zinc, lead, iron.

DESCRIPTION: Chalcopyrite, magnetite, and sphalerite occur in skarn and sills of biotite diorite.

WORK DONE: Between June and September trenching was carried out in a logged-off area of the property. Approximately 600 feet of shallow trenches was drilled and blasted following the mineralized zone from Lady Luck claims across the Kenad claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, pp. 97, 98; 1971, p. 113; Assessment Report 3585.

PORPH (No. 27, Fig. F)

By B. M. Dudas

LOCATION: Lat. 54° 28' Long. 128° 16' (103I/8W)
OMINECA M.D. On the south side of the Zymoetz River, 12 miles east-southeast of Terrace and 1 mile west of Dardanelle Creek.

CLAIMS: PORPH 1 and 2.

ACCESS: Seventeen miles of good road along the Zymoetz River from the turnoff on Highway 16.

OWNER: R. H. BATES, 2101 Pearl Street, Terrace.

METALS: Copper, silver.

WORK DONE: Surface mapping, grid-line location, and a magnetometer survey were carried out over a 500 by 6,000-foot area.

NORTHWEST **(No. 16, Fig. F)**

LOCATION: Lat. 54° 29' Long. 128° 01' (103I/8E)
OMINECA M.D. At elevations of 3,000 to 3,500 feet on the southwest slope of Treasure Mountain, north of the confluence of Clore and Zymoetz Rivers, 2 miles east of Salmon Run Creek.

CLAIMS: DF 1 to 8, 11 to 19.

ACCESS: By helicopter from Terrace, 22 miles.

OWNER: R. J. MacNeill.

OPERATOR: METRON EXPLORATIONS LTD., 2302, 401 Bay Street, Toronto, Ont.

METAL: Copper.

DESCRIPTION: The claims are underlain by Lower Jurassic basic to intermediate volcanic rocks. Chalcocite, bornite, and chalcopyrite occur in shears and veins in the volcanic rocks.

WORK DONE: Geological mapping, 1 inch equals 400 feet.

REFERENCES: *Minister of Mines, B.C.,* Ann. Repts., 1914, p. 118; 1965, p. 71; Assessment Report 3959.

WB **(No. 17, Fig. F)**

LOCATION: Lat. 54° 29' Long. 128° 04' (103I/8E)
OMINECA M.D. At approximately 3,000 feet elevation on the north side of the Zymoetz River, west of Salmon Run Creek, 22 miles east of Terrace.

CLAIMS: WB 1 to 22.

ACCESS: By helicopter from Terrace, 24 miles.

OPERATOR: METRON EXPLORATIONS LTD., 2302, 401 Bay Street, Toronto, Ont.

DESCRIPTION: The claims are underlain by Lower Jurassic volcanic rocks which locally are pyritized and silicified.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims.

REFERENCE: Assessment Report 3960.

CROESUS **(No. 24, Fig. F)**

LOCATION: Lat. 54° 32.8' Long. 128° 25.6' (103I/9W)
OMINECA M.D. Between 500 and 3,750 feet elevation on the west side of Kleanza Mountain.

CLAIMS: CROESUS, totalling 66.

ACCESS: By road from Highway 16, 1 mile.

OWNER: KENDAL MINING & EXPLORATION LTD. (formerly Kleanza Mines Ltd.), Box 580, Terrace.

METALS: Copper, silver, gold, lead, zinc.

WORK DONE: Soil samples totalling 954 collected during 1965 to 1969 were analysed.

Stripping was carried out on Croesus 43 and 44.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1967, pp. 80-82; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 114.

KDL (No. 22, Fig. F)

LOCATION: Lat. 54°'32' Long. 128° 20' (103I/9)
OMINECA M.D. Between 750 and 3,000 feet elevation on Kendall Creek, 3 miles east of Kleanza Mountain, 12 miles east-northeast of Terrace.

CLAIMS: KDL 1 to 24, 26, 28, 30, 32.

ACCESS: By helicopter from Terrace, 12 miles or by road and trail from Highway 16, 7.5 miles.

OWNERS: Kendal Mining & Exploration Ltd. (formerly Kleanza Mines Ltd.) and R. H. Bates.

OPERATOR: THE HANNA MINING COMPANY (COASTAL MINING COMPANY), 506, 1200 West Pender Street, Vancouver 1.

METALS: Copper, molybdenum, silver, lead, zinc.

DESCRIPTION: The claims are underlain by greywacke, boulder conglomerate, banded volcanic sandstone, volcanic breccia, flows, and fine clastic material of the Hazelton Group. These are intruded by Coast Range quartz diorite porphyry intrusive rocks. Chalcopyrite occurs in boulder conglomerate and locally in porphyry dykes.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering all claims; geochemical soil and silt survey, 414 samples covering KDL 1, 3, 5-7, 9-12, 21, 22, 28, 30.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 114; Assessment Reports 2325, 4275.

HOPE SILVER (No. 23, Fig. F)

LOCATION: Lat. 54° 58' Long. 128° 53' (103I/15W)
SKEENA M.D. At approximately 1,150 feet elevation near Belway Creek, southeast of Sand Land, 35 miles north of Terrace.

CLAIMS: BB, BOX, BOB, GRISSLY, HOPE, etc., totalling 14.

ACCESS: By road from Terrace, 40 miles.

OWNER: KENDAL MINING & EXPLORATION LTD. (formerly Kleanza Mines Ltd.), Box 580, Terrace.

METALS: Gold, silver, lead, zinc.

DESCRIPTION: A quartz-breccia-sulphide vein, up to 15 feet wide and occupying a steeply dipping southeast striking shear zone in Bowser sedimentary rocks, contains pyrite, sphalerite, galena, chalcopyrite, and tetrahedrite.

WORK DONE: Line-cutting, trenching 35 feet on Hope 1; surface diamond drilling, three holes totalling 83 feet on Hope 1.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 118.

REGA, JACKAL, MAG, NIILO (No. 4, Fig. F)

LOCATION: Lat. 54° 55'-58' Long. 128° 12.5'-17.5' (103I/16)
SKEENA M.D. Between 4,000 and 6,000 feet elevation on the southwest slopes of Seven Sisters Mountain, near Cedarvale.

CLAIMS: REGA, MAG, and NIILO, totalling 84 plus JACKAL, totalling 6 (optioned from Seven Sisters Mining Ltd., a subsidiary of Magnetron Mining Ltd.).

ACCESS: By four-wheel-drive vehicle road from Highway 16 near Cedarvale, 10 miles.

OWNER: MAGNETRON MINING LTD., 2020, 777 Hornby Street, Vancouver 1.

METALS: Copper, lead, zinc, silver.

DESCRIPTION: Galena, sphalerite, pyrite, pyrrhotite, and chalcopyrite occur as veins and lenses in folded and faulted sedimentary rocks.

WORK DONE: Geological mapping, magnetometer survey, and trenching.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, pp. 83-84; Assessment Report 3541.

NASS RIVER 103P

MAPLE BAY (OUTSIDER) MINE (No. 25, Fig. F) By E. W. Grove and B. M. Dudas

LOCATION: Lat. 55°25' Long. 130° 00' (103P/5W)
SKEENA M.D. About 35 miles south of Stewart at Maple Bay, on the east side of Portland Canal.

CLAIMS: Sixty-five by location and 23 Crown granted (STAR, REGINA, COPPER KING, TUNNEL FRACTION, ANACONDA, PRINCESS, EAGLE, MAY QUEEN).

ACCESS: By boat or helicopter from Stewart.

OWNER: Consolidated Maple Bay Mines Limited (formerly Maple Bay Copper Mines Limited).

OPERATOR: ALASKA KENAI OILS LIMITED (formerly Great Slave Mines Ltd.), 200, 890 West Pender Street, Vancouver 1.

METALS: Copper, gold, silver.

DESCRIPTION:

The Outsider mine located 1 mile north of Maple Bay was initially developed in 1906 by the Brown Alaska Company. The main quartz vein has a width of from 2 to 21 feet and has been traced on surface for a length of 3,000 feet. Underground development includes seven levels with the lowest and main adit at 900 feet elevation. Underground development over a length of more than 2,000 feet included stopes from 900 level to surface, a winze, and drifting from 800 level.

Ore shipped from the Outsider mine in 1905-06 and from 1922-1928 totalled about 140,000 tons which averaged 1.86 per cent copper and contained some silver and minor gold. Most of this production was shipped to the Anyox smelter as siliceous flux. The mine was shut down in 1927 when a more convenient source of quartz was found near the smelter.

The Outsider vein consists mainly of massive to granular milky white quartz with scattered minor country rock inclusions. The vein trends north-northeast and dips steeply to the east. The ore shoots above 900 level comprised banded fine-grained grey to white quartz with granular to fine-grained chalcopyrite, pyrrhotite, and minor pyrite. The ore shoots averaged 8 to 12 feet wide and were localized in wide vein sections marked by inflections or kinks in the vein attitude. Only minor sulphide mineralization has been found in the restricted vein widths.

The country rocks in which the Outsider and associated veins occur have been correlated by the writer with Lower Jurassic rocks to the northwest in the Unuk River area. The Maple Bay sequence includes mainly andesitic pillow lavas and greywacke-siltstone units, with intercalated massive limestone members. Immediately to the east of the Outsider claims these rocks have been deformed and form part of a northerly trending cataclasite zone formed during the late Early Jurassic epoch. Quartz veins east of Maple Bay which are similar to the Outsider vein crosscut the cataclasites and are thought to represent late Lower Jurassic mineralization.

Development on the Outsider property during 1972 consisted of drifting at about 600 feet elevation along the assumed lower part of the main Outsider vein. The work stopped short of downward projected quartz sulphide ore zone.

WORK DONE: A new adit was started at 600 feet elevation near Roberson Creek and on the Tunnel Fraction mineral claim. This adit is below that driven in 1921 at 900 feet elevation. The 6-foot by 7-foot drift was driven on vein for 1,000 feet. It is estimated that the drift was about 300 feet short of the sulphide lens mined on the 900 level during 1925-26.

REFERENCES: *Geol. Surv., Canada,* Mem. 175, p. 102; *Minister of Mines, B.C.,* Ann. Rept., 1918, p. 73; 1921, p. 58; 1926, p. 85; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, pp. 77-81; 1971, p. 121.

RED WING (No. 31, Fig. F)

By E. W. Grove

LOCATION: Lat. 55° 21.3'-24.4' Long. 129° 49.3'-54.2' (103P/5W)
SKEENA M.D. About 1.8 miles west of Granby Bay at elevation 1,850 feet near the head of Tauw Creek.

CLAIMS: RED JACKET, RED WING, RED Fraction (Lots 1991 to 1993); CM, PAUL, DOUG, RON, etc. (approximately 71 located claims).

ACCESS: By boat or aircraft from Prince Rupert, 95 miles.

OWNER: Interplex Spa Industries Ltd.

OPERATOR: BOW RIVER RESOURCES LTD., 333, 885 Dunsmuir Street, Vancouver 1.

METALS: Copper, silver, gold.

DESCRIPTION:

The general geology of the area is described in the Annual Report of the Minister of Mines and Petroleum Resources for 1965, pages 57 to 61. The Red Wing deposit is one of nine known zones of massive sulphide mineralization localized within andesitic pillow lavas near an overlying contact with a thinly bedded siltstone-greywacke sequence. These units have been correlated by the writer with Middle Jurassic units north of Stewart

(Grove, Bull. 58, 1971). Recent studies suggest that like other massive sulphide deposits in the Anyox area the Red Wing mineralization has a volcanogenic origin.

Mineralization consists of crudely banded, deformed pyrite, chalcopyrite, pyrrhotite, and sphalerite. Host rocks are chloritic to biotitic schists developed within andesite pillow breccia and volcanic breccia.

WORK DONE: Magnetometer and electromagnetic surveys on CM 7-11 and CM 38.

REFERENCES: Grove, E. W. (1971), Geology and Mineral Deposits of the Stewart Area, British Columbia, *B.C. Dept. of Mines & Pet. Res.*, Bull. 58; *Minister of Mines, B.C.*, Ann. Rept., 1965, pp. 57-61; *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 120; Assessment Report 3994.

CD, CU (No. 32, Fig. F)

LOCATION: Lat. 55° 25' Long. 129° 51' (103P/5W)
SKEENA M.D. At Anyox between Bonanza Creek and Carney Lake, from sea-level to 1,200 feet elevation.

CLAIMS: Four mineral leases (covering 21 claims and fractions) and 100 located claims including CD, CU, and SUNSHINE.

ACCESS: By boat or aircraft from Prince Rupert, 90 miles.

OWNER: ARCADIA EXPLORATIONS LTD., Box 35368, Station E, 2021 West 42nd Avenue, Vancouver 13.

METALS: Copper, iron.

DESCRIPTION: *See* the Annual Report of the Minister of Mines and Petroleum Resources for 1965, page 57 (Grove, E. W., Observatory Inlet).

WORK DONE: Geochemical survey, 120 soil samples and 66 rock and chip samples covering Sunrise, Red Light Fraction, CD 33 and 34 Fractions,sCU 26 and 27, Independence, Lone Wolfe, and Totem claims; trenching, 2,500 cubic feet;s stripping, 600 feet;s and percussion drilling, 217 holes totalling 910 feet on CD 34 Fraction, CU 29, 25 Fraction, and 62, and Independence claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 81; 1971, p. 121.

BRITISH COLUMBIA MOLYBDENUM MINE (No. 21, Fig. F)

By B. M. Dudas

LOCATION: Lat. 55° 25' Long. 129° 25.5' (103P/6W)
SKEENA M.D. The property is on Patsy Creek, the east fork of Lime Creek and is 5 miles southeast of the head of Alice Arm Inlet, at elevation 2,000 feet.

CLAIMS: The property consists of 99 full and fractional claims, of which the key claims are PATRICIA 1 to 5.

ACCESS: From Prince Rupert by boat (weekly coastal service) or by pontoon-equipped aircraft. Local freight is handled by coastal shipping and off-loading to a company barge at Alice Arm. All other freight supplies and shipping of concentrate are done by barge from Vancouver.

OWNER: BRITISH COLUMBIA MOLYBDENUM LIMITED, 730, 505 Burrard Street, Vancouver 1; mine office, Kitsault (closed August 9, 1972).

(103P/6W)

METAL: Molybdenum (production shown on Table I).

WORK DONE:

The operation was suspended for an indefinite period on April 28, 1972 due to the company's inability to sell the molybdenum output from the mine. At the end of April, the company had at hand 2,000,000 pounds of molybdenite concentrate. The mine was estimated to have a 20-year life at the beginning of operation. At the time of suspension, it is estimated the mine remains capable to support production of molybdenum for approximately 15 years at the rated (7,000 tons per day) capacity of the mill.

Open-pit mining started in August 1967 and the concentrator commenced operation in October 1967. Production statistics from start-up until suspension of operation are listed below:

Year	Ore Mined tons	Waste Mined tons	Production Molybdenite Content pounds
1967	88,719	83,450	132,231
1968	2,147,994	4,632,094	5,089,969
1969	2,356,514	3,466,618	5,567,709
1970	2,693,228	4,229,730	6,141,305
1971	2,476,175	2,510,590	5,106,964
1972	521,625	585,511	1,085,204

Open-pit mining was at 30-foot bench heights with an overall pit wall slope of 45 degrees. The finalspit wall configuration consists of two bench heights and a berm. During the 4½ years of operation there were no major pitwall failures, although minor joint related problems were noted on the slopes inclined to the southeast. Rock-mechanic studies and tests conducted during 1969 and 1970 indicated that overall slopes as steep as 50 degrees in the northeast, 55 degrees in the northwest and southeast, and 60 degrees in the southwest mine quadrants would appear to be within the structuralscapabilities of the rock. These studies also revealed that near-surface groundwater does occur in the pit. However, its effect on design and stability on the proposed slopes was not evaluated, thus the overall pit slope remained at 45 degrees. The lowest level of mining done to date is the 1835 bench. The top bench, where mining started in 1967, is the 2190 level. (All benches are referred to above sea-level elevations.) From the east end of the pit a lower haul road constructed during 1971 and leading to the crusher was used throughout 1972. This road decreased the haulage distance by 70 per cent.

Molybdenite concentrate was produced by flotation process. The lead impurities were leached by nitric acid. Numerous improvements were made to the concentrator during the past two years and at the time of closure the mill was capable of handling upsto 10,000 tons per day. The original mill design was 6,500 tons per day. The recovery and concentrate grade was also improved. The average grade of concentrate for 1971 was 92.03 per cent molybdenite (the last year of continuous operation).

At the time of suspension of operation, indications were that the over supply of molybdenum will last for about three years. Thus, a decision was made to dispose of all the mine mobile equipment. Such equipment would deteriorate if left outside and the model and/or size of equipment may be outdated by the time production resumes.

Permanent buildings such as the office building, concentrator, townsite, bunkhouses, and recreational complex were left in good repair. The crushing plant and concentrator equipment were cleaned and serviced and all electrical motors sealed in plastics to minimize moisture damage. Power was disconnected to all buildings to reduce fire hazards but all wiring and installation were left intact. In November, British Columbia Hydro discontinued supplying power. However, all transformers and powerlines were left in good repair.

Reclamation tests and studies are being continued. All vacant land left after removal of temporary buildings was seeded with grass to minimize erosion. The school yard area was graded and seeded.

At april 28, 1972, the time of suspension of operations, the total personnel was 205 and about 45 persons remained on the property until August 9 to complete the clean-up. Since August 9 two watchmen were on the property.

The responsibility to oversee the property during the suspension of mining and to maintain contacts with public and government was assigned to Mr. D. A. Barr, Vice President, Kennco Explorations, (Canada) Limited (wholly owned subsidiary of Kennecott Copper Corporation of New York).

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1964, pp. 30-36; 1967, pp. 47, 48; *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 121.

LIME (No. 3, Fig. F)

LOCATION: Lat. 55° 24.8'-26.6' Long. 129° 27'-29' (103P/6W)
SKEENA M.D. On Mohawk Mountain, approximately 3.5 miles south of Alice Arm.

CLAIMS: LIME 1 to 28.

ACCESS: By boat or helicopter from Alice Arm.

OWNER: KENNCO EXPLORATIONS, (WESTERN) LIMITED, 730, 505 Burrard Street, Vancouver 1.

DESCRIPTION: The claims are underlain by slightly altered sedimentary rocks, mainly greywacke.

WORK DONE: Geological and geochemical surveys during 1971.

REFERENCE: Assessment Report 3448.

KITSOL (No. 10, Fig. F)

By N. C. Carter

LOCATION: Lat. 55° 41' Long. 129° 31' (103P/12E)
SKEENA M.D. At approximately 1,175 feet elevation immediately north of the confluence of Evindsen Creek and the Kitsault River.

CLAIMS: KITSOL 1 and 2 (Lots 3814 and 3815).

ACCESS: By road from Alice Arm, 18 miles.

OWNER: DOLLY VARDEN MINES LTD., 1400, 409 Granville Street, Vancouver 2.

METAL: Silver.

DESCRIPTION:

Exploration work consisted of three angle holes collared on the east side of the Kitsault River and drilled in a northwest direction toward the vein on the west side of the river on the Kitsol 1 (Lot 3814) claim. Country rocks are grey to purple volcanic conglomerates and breccias in which one-half to 1-inch rounded volcanic fragments are closely packed. One hole, drilled at a 45-degree angle, intersected a 50-foot core length of quartz-barite-jasper-marcasite vein material 300 feet vertically below the surface trace of the vein. The vein is typical of the Torbrit type, containing 1-inch barite crystals and featuring colloform banding of quartz and jasper. The vein also contains concentrations of pyrargyrite and native silver and averages 5 ounces of silver per ton over the entire vein length, including an 18-foot section grading 15 ounces of silver per ton.

WORK DONE: Surface geological mapping, 1 inch equals 40 feet and surface diamond drilling, three holes totalling 1,657 feet on Kitsol 1.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, pp. 81-86.

DOLLY VARDEN (No. 12, Fig. F)

By N. C. Carter

LOCATION: Lat. 55° 41' Long. 129° 31' (103P/12E)
SKEENA M.D. Between 1,500 and 1,800 feet elevation on the west side of the Kitsault River, south of Evindsen Creek.

CLAIMS: DOLLY VARDEN 1 to 6 (Lots 3192 to 3197).

ACCESS: By road from Alice Arm, 7 miles.

OWNER: DOLLY VARDEN MINES LTD., 1400, 409 Granville Street, Vancouver 2.

METAL: Silver.

DESCRIPTION:

The 1640 level was re-opened to facilitate a geological study of the property. Ore shoots mined in the early 1920's were contained within faulted vein segments with better grades apparently at or near intersections of northeast and northwest faults. The hangingwall of the vein is invariably a red, hematitic tuff breccia while the footwall is a grey-green sericite schist streaked with pyrite. Northeast-striking lamprophyre dykes, typical of the area, cut the veins.

Five holes were drilled from an area west of and above the glory holes. No new ore shoots were found.

WORK DONE: Surface geological mapping, 1 inch equals 100 feet covering two claims; underground geological mapping, 1 inch equals 40 feet on the 1638 level; surface diamond drilling, five holes totalling 1,772 feet on Dolly Varden 1 and 2.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1936, pp. B35-B38; 1951, pp. 105-107; *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 125, 126.

RED POINT (No. 9, Fig. F)

LOCATION: Lat. 55° 41' Long. 129° 31' (103P/12E)
SKEENA M.D. At approximately 1,800 feet elevation on the west side of the Kitsault River valley, north of Black Bear Creek.

(103P/12E)

CLAIMS: RED POINT, RED POINT EXTENSION (Lots 3809 and 3810) and ROAN ANTELOPE and ROAN ANTELOPE 1 located claims.

ACCESS: By road and trail from Alice Arm, 19.5 miles.

OWNER: DOLLY VARDEN MINES LTD., 1400, 409 Granville Street, Vancouver 2.

METALS: Copper, silver, lead.

DESCRIPTION: Quartz veins containing chalcopyrite occur in silicified and pyritized 'Copper Belt' feldspar porphyry near their contacts with sedimentary and volcanic rocks. At least one silver-bearing vein has also been explored on these claims.

WORK DONE: Geochemical survey, 7 samples covering Roan Antelope; surface diamond drilling, four holes totalling 200 feet on Roan Antelope and Red Point Extension.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, pp. 81-86.

SURPRISE (No. 11, Fig. F)

By N. C. Carter

LOCATION: Lat. 55° 42' Long. 129° 31' (103P/12E)
SKEENA M.D. At approximately 1,500 feet elevation on the west side of the Kitsault River, opposite Silverwolf Creek.

CLAIMS: SURPRISE, SURPRISE Fraction.

ACCESS: By road from Alice Arm, 19 miles.

OWNER: DOLLY VARDEN MINES LTD., 1400, 409 Granville Street, Vancouver 2.

METALS: Copper, silver.

DESCRIPTION:

Considerable trenching was done in the area of the original showings. A gently dipping quartz-barite vein (15 to 35 degrees east), roughly paralleling the slope, gives an initial impression of significant widths which are in reality the downhill extension of the vein. Host rocks are intensely altered feldspar porphyries which contain numerous inclusions of recrystallized sedimentary rocks. Eight holes were drilled with generally negative results although one hole intersected a 20-foot quartz-barite vein containing galena, sphalerite, native silver, and chalcopyrite.

WORK DONE: Surface geological mapping, 1 inch equals 40 feet and surface diamond drilling, eight holes totalling 1,373 feet on Surprise claim.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, pp. 81-86; 1971, pp. 125, 126.

MUSKETEER (No. 13, Fig. F)

LOCATION: Lat. 55° 42' Long. 129° 30' (103P/12E, 11W)
SKEENA M.D. At approximately 1,200 feet elevation on the east side of the Kitsault River between Tiger and Silverwolf Creeks.

CLAIMS: ATHOS (Lot 4066), D'ARTAGNAN, D'ARTAGNAN 1 (Lots 4069, 4071).

ACCESS: By road from Alice Arm, 18.5 miles.

(103P/13W)

OPERATOR: DOLLY VARDEN MINES LTD., 1400, 409 Granville Street, Vancouver 2.

METAL: Silver.

DESCRIPTION: Drilling was carried out in the main adit area to test the quartz-carbonate-barite-jasper vein at depth. Country rocks are red and green volcanic tuff breccias. One hole intersected 8 feet of vein material 200 feet vertically below the adit level, containing some pyrargyrite and native silver and grading 15 ounces of silver per ton.

WORK DONE: Surface geological mapping, 1 inch equals 40 feet covering Athos; geochemical survey, 12 samples covering D'Artagnan; trenching, 300 feet on Athos; surface diamond drilling, four holes totalling 1,234 feet on Athos.

REFERENCES: *Minister of Mines, B.C.* Ann. Rept., 1951, pp. 99-101; *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 125, 126.

DOMINION (No. 15, Fig. F)

LOCATION: Lat. 55°'53.5' Long. 129°'54' (103P/13W)
SKEENA M.D. At the head of Kate Ryan Creek, 5 miles southeast of Stewart, at elevation 3,000 feet.

CLAIMS: LUCKY STRIKE, ALAMEDA, VELVET, MOONSHINE, STAR, CARDENA (Lots 5123 to 5128).

ACCESS: By helicopter from Stewart, 5 miles.

OPERATOR: McINTYRE PORCUPINE MINES LIMITED, 1003, 409 Granville Street, Vancouver 2.

METALS: Copper, lead, zinc.

DESCRIPTION: Country rocks are schistose Lower Jurassic volcanic rocks of the Hazelton Group. Immediately south the deformed andesitic flows and epiclastics have been intruded by the Tertiary Hyder pluton, marking the easternmost edge of the Coast Plutonic Complex.

WORK DONE: Geochemical soil and silt survey, 200 samples.

REFERENCE: *Minister of Mines, B.C.*, Ann. Rept., 1927, p. 84.

LITTLE JOE, GYPSY (No. 14, Fig. F)

LOCATION: Lat. 55° 59' Long. 129° 55' (103P/13W)
SKEENA M.D. On Albany Creek, 3.5 miles north of Stewart at approximately 4,000 feet elevation.

CLAIMS: LITTLE JOE (Lot 873), GYPSY (Lot 416), and LUCKY SEVEN (Lot 874) Crown grants plus 17 located claims and fractions.

ACCESS: By helicopter from Stewart, 3.5 miles.

OWNER: STARBIRD MINES LTD., c/o 205, 850 West Hastings Street, Vancouver 1.

METALS: Silver, gold.

DESCRIPTION: Lenticular sulphide-bearing quartz veins are localized within deformed Middle Jurassic siltstones of the Salmon River Formation.

WORK DONE: Trenching, 3,160 cubic feet on Little Joe and Julie Fraction.

REFERENCES: Grove, E. W. (1971), *B.C. Dept. of Mines & Pet. Res.*, Bull. 58; *Minister of Mines, B.C.*, Ann. Rept., 1968, pp. 53, 54; *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, pp. 57, 58; 1971, p. 126.

BLACK HILL, NELLIE, BLUE GROUSE (No. 18, Fig. F)

By E. W. Grove and B. M. Dudas

LOCATION: Lat. 55° 57′ Long. 129° 53′ (103P/13E)
SKEENA M.D. Near the head of Glacier Creek between 3,800 and 4,700 feet elevation.

CLAIMS: BLACK HILL 1 and 2, NELLIE 4, and SNOW WHITE Crown-granted claims and BLUE GROUSE 1 to 3, SALT, JL Fraction, and JL located claims.

ACCESS: By helicopter from Stewart, about 6 miles, by trail and road about 12 miles.

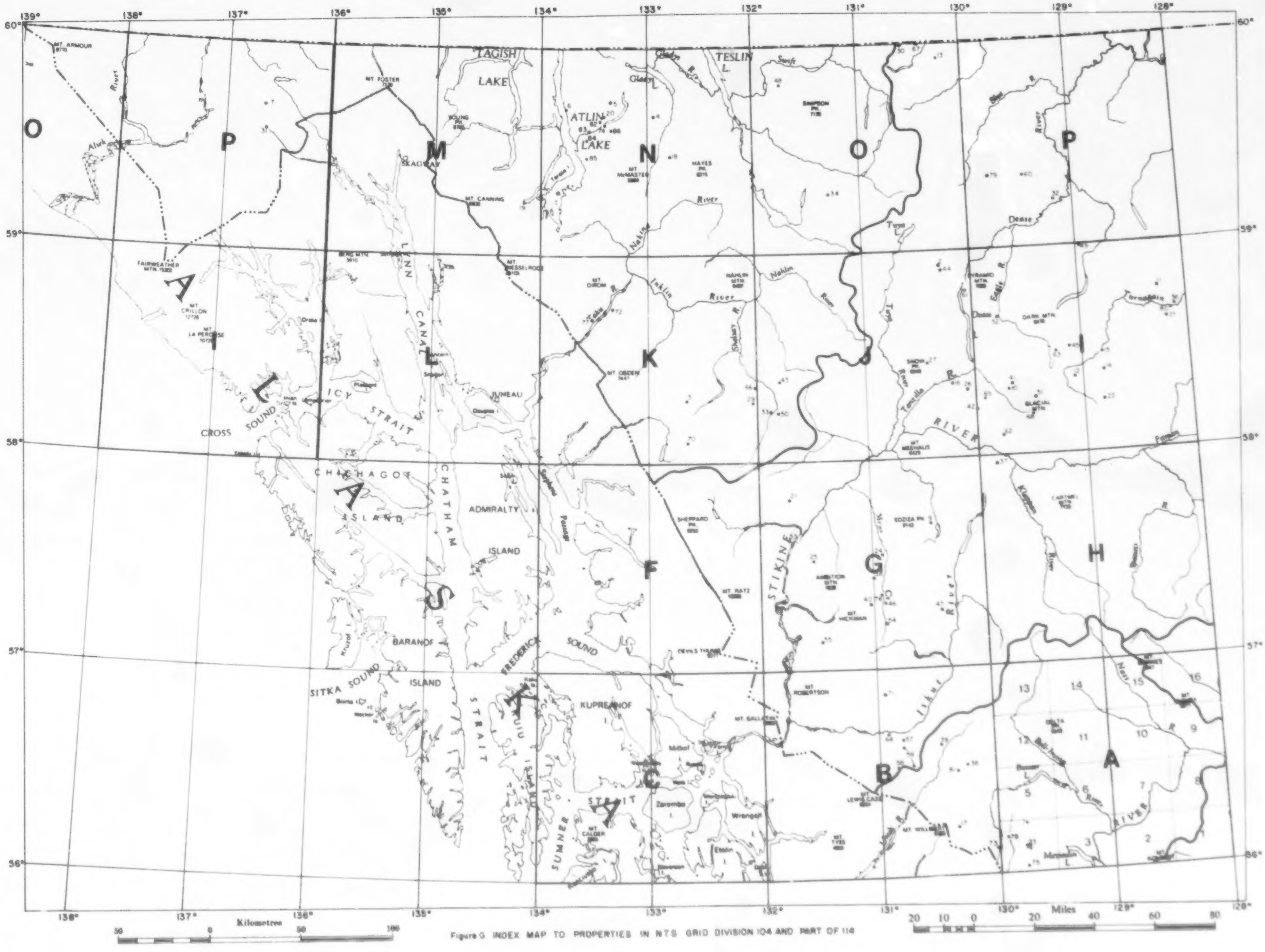
OWNER: LEHTO RESOURCES LTD., 750, 890 West Pender Street, Vancouver 1.

METALS: Lead, zinc, silver, gold.

DESCRIPTION: Intersecting sulphide-bearing north-south and east-west quartz-calcite-barite veins are localized within dark thin-bedded siltstones of the Middle Jurassic Salmon River Formation near the contact with an intrusive augite porphyry (Cretaceous). The veins are variable in width and in amount of sulphide. Tetrahedrite and galena are locally important as carriers of silver and gold. Tetrahedrite-bearing dark brown sphalerite is an important mineral in the veins.

WORK DONE: No. 1 adit on Blue Grouse 1 was slashed out to 6 by 7 feet for 100 feet and extended to 276 feet north. A second adit, 4 by 6 feet, was driven 60 feet below No. 1 adit for 65 feet. Two thousand five hundred tons of high-grade lead-silver ore was stockpiled for shipment to Adam mill on Bitter Creek. At 4,200 feet elevation a base camp suitable for six persons was constructed.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1928, p. 99; 1929, p. 96.



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TESLIN L.
SKAGWAY
MT FOSTER
MT CANNING
MT McMASTER
HAYES PK
SIMPSON PK
Nakina River
Dease
FAIRWEATHER MTN 15300
MT CRILLON 12726
MT LA PEROUSE 10728
LYNN CANAL
MT WESSELROOT
MT DIRON
Inklin River
NAHLIN MTN
Nahlin River
Sheslay R.
Tuya River
MT OGDEN
JUNEAU
ICY STRAIT
CROSS SOUND
Tanzilla R.
DARK MTN
GLACIAL MTN
Turnagain R.
RIVER
MT MEEHAUS
CHICHAGOF ISLAND
CHATHAM STRAIT
ADMIRALTY ISLAND
Stephens Passage
SHEPPARD PK
EDZIZA PK
STIKINE
AMBITION MTN
MT HICKMAN
MT RATZ
Klappan River
CARTMEL MTN
BARANOF ISLAND
SITKA SOUND
FREDERICK SOUND
DEVILS THUMB
MT ROBERTSON
MT GALLATIN
KUPREANOF
KUIU ISLAND
Iskut River
STRAIT
Mitkof
Wrangell
Zarembo I.
Etolin I.
SUMNER STRAIT
MT CALDER
MT LEWIS CASS
MT TYEE
Nass River
Meziadin L.
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20
40
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80

Figure G INDEX MAP TO PROPERTIES IN N T S GRID DIVISION 104 AND PART OF 114

KEY TO PROPERTIES ON INDEX MAP, FIGURE G.

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3. KAREN, page 553.
4. CANDY, page 557.
5. HOBO, page 558.
6. NORSK, page 558.
7. LUNAR, page 563.
9. SPECTRUM, page 531.
10. LOTUS, page 539.
11. JOHNNY, page 546.
12. JJR, page 540.
13. AMY, page 560.
14. TOM, T, page 543.
15. TURN, page 544.
16. HU, page 551.
17. GRANDUC MINE, page 514.
18. NI, FIRE, page 556.
19. MOLLY, page 555.
20. GARNET, page 557.
21. LIM, BRAD, page 535.
22. J, page 573.
23. MINA, page 512.
24. IN, page 534.
25. DOK, page 534.
26. QUEEN, page 538.
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29. NORM, page 553.
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33. KID, GRIZZLY, page 547.
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52. COP, page 545.
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56. ARC, page 528.
57. SHAN, page 518.
58. PINS, page 517.
59. TAMI, KIM, page 517.
60. JOEM, RAIN, DAKO, page 561.
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63. ASB, page 540.
64. INEL, page 518.
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67. LUCK, page 560.
68. PAT, page 537.
69. KAY, KING, KO, page 538.
70. VI, page 546.
71. DIRK (KEN), page 519.
72. MIKE, page 554.
73. MARTHA ELLEN (HERCULES), page 513.
74. ADERA, page 557.
75. ROOSEVELT, page 512.
76. SNO, BIRD (LIARD COPPER); NABS (PARAMOUNT), page 527.
77. POTLATCH-BANKER, page 554.
78. MAYBEE, page 513.
79. CASSIAR MINE, page 573.
80. P.M.L. NOS. 893, 1027, 1032, page 569.
81. SULPHURETS CREEK, page 569.
82. BIRCH CREEK, page 570.
83. PINE CREEK, page 570.
84. SPRUCE CREEK, page 570.
85. McKEE CREEK, page 570.
86. OTTER CREEK, page 570.

BOWSER LAKE 104A

MINA (No. 23, Fig. G)

LOCATION: Lat. 56° 05.5'-07.6' Long. 129° 43.5'-50.0' (104A/4) SKEENA M.D. Between elevations of 1,000 and 4,500 feet on the Bear River, 24 miles northeast of Stewart.

CLAIMS: MINA, WATERFALL, BEAR, totalling 28 located claims and 23 Crown-granted claims. (The Crown-granted claims are part of the former Crest Copper group.)

ACCESS: By the Stewart-Cassiar Highway from Stewart.

OWNER: KEITH COPPER MINES LTD., 210, 890 West Pender Street, Vancouver 1.

DESCRIPTION: The claims are underlain by argillites, quartzites, limestone, and tuff of the Bitter Creek Formation.

WORK DONE: Magnetometer survey covering Bear 1-9 and Mina 1, 3, 5, 11, and 13 during 1971.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1967, p. 35 (Crest Copper); Assessment Reports 1109, 3603.

ROOSEVELT (No. 75, Fig. G) By B. M. Dudas

LOCATION: Lat. 56° 02' Long. 129° 47' (104A/4W) SKEENA M.D. Ten miles northeast of Stewart, near Bitter Creek and Roosevelt Creek junction.

CLAIMS: Thirty Crown-granted (ROOSEVELT, MORGAN, LEAD COIL, ALBERTA, CREEK, RADIO, ORE HILL, MILLER, PONTIAC, NORTHERN BELL, MAYOU) mineral claims, Mineral Lease M-147, and TERRY 1 to 55.

ACCESS: By good road from the Stewart-Cassiar Highway following Bitter Creek.

OWNERS: Crest Silver Company Limited and Ardo Mines Ltd.

OPERATOR: ARDO MINES LTD., 210, 890 West Pender Street, Vancouver 1.

METALS: Copper, gold, silver, lead, zinc.

DESCRIPTION: Mineralization consists of quartz veins of variable width and extent. Sulphide minerals are mainly sphalerite, galena, and minor sulphosalts.

WORK DONE:

A new 6 by 7-foot haulage adit was driven 25 feet below the Silver adit on the vein. Two short timbered raises connect the new adit with the Silver adit. Five draw points were established from the haulage drift and the gathering drift. Shrinkage stoping started from the gathering drift between the two raises. A total of 250 feet of underground development was completed. In addition, a base camp suitable for six men, a trestle way, and an ore bin were constructed. A 5-mile access road along Bitter Creek was up-graded for the purpose of hauling ore to the Adam mill concentrator; however, no ore was shipped. In December the operation closed due to icing-up of the levels.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, pp. 74, 75; 1971, pp. 32, 33.

MAYBEE (No. 78, Fig. G)

By B. M. Dudas

LOCATION: Lat. 56° 10' Long. 129° 56' (104A/4W)
SKEENA M.D. Approximately 5 miles north of American Creek and Bear River junction.
CLAIMS: MAYBEE (Lot 3226), LOUISE (Lot 1555), BLUE JAY (Lot 3255), RUBY (Lot 887) and AX 1 to 8 and AXEL Fraction.
ACCESS: By helicopter from Stewart, approximately 16 air-miles, or by road and trail.
OWNER: CREST VENTURES LIMITED, 720, 470 Granville Street, Vancouver 2.
METALS: Copper, lead, zinc, silver, gold.
WORK DONE: A 14-foot well-mineralized quartz vein was exposed on the Maybee Crown grant (Lot 3226) during the season. Road construction started from the Bear River turnoff on the Stewart-Cassiar Highway. A 100-foot bridge was erected over American Creek and about 3 miles of the old Mountain Boy mine road was reconstructed.
REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1929, p. 104; 1930, p. 109, Grove, E. W. (1971), *B.C. Dept. of Mines & Pet. Res.*, Bull. 58.

TODD (No. 1, Fig. G)

LOCATION: Lat. 56° 13.4' Long. 129° 46.5' (104A/4W)
SKEENA M.D. Between elevations of 3,500 and 4,500 feet at the headwaters of Todd Creek, 22 miles north of Stewart.
CLAIMS: TODD 1 to 6.
ACCESS: By helicopter from Stewart, 22 miles.
OPERATOR: PANTHER MINES LTD., 333, 885 Dunsmuir Street, Vancouver 1.
METALS: Copper, silver, gold.
DESCRIPTION: Chalcopyrite, pyrite, and minor specularite occur along a zone approximately 100 feet wide within a felsite intrusion.
WORK DONE: Geological survey during 1971.
REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1960, p. 7; Assessment Report 3428.

ISKUT RIVER (104B)

MARTHA ELLEN (HERCULES) (No. 73, Fig. G)

LOCATION: Lat. 56° 07' Long. 130° 01' (104B/1E)
SKEENA M.D. On the south slope of Mount Dillworth, in the Salmon River valley.
CLAIMS: MARTHA ELLEN (Lot 1521) and PROVINCE (Lot 3208).

(104B/1W)

ACCESS: By road from Stewart, 20 miles.

OPERATOR: CONSOLIDATED SILVER BUTTE MINES LTD., 705, 850 West Hastings Street, Vancouver 1.

METALS: Gold, silver, lead, zinc.

WORK DONE: Rehabilitated the Silbak Premier mill.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1923, p. 83; Grove, E. W. (1971), *B.C. Dept. of Mines & Pet. Res.,* Bull. 58, p. 132.

GRANDUC MINE (No. 17, Fig. A)

By B. M. Dudas

LOCATION: Lat. 56° 13′ Long. 130° 21′ (104B/1W)
SKEENA M.D. The mine is at the head of the Leduc River, 25 miles north-northwest of Stewart, between elevations of 1,800 and 4,000 feet. The concentrator and campsite are at Tide Lake. The townsite is at Stewart.

CLAIMS: One hundred and sixty-four Crown-granted and 186 located mineral claims.

ACCESS: Thirty-one miles by road from Stewart, through Hyder, Alaska, to the Tide Lake camp and concentrator then by an 11.6-mile tunnel to the mine.

OWNER: Granduc Mines, Limited.

OPERATOR: GRANDUC OPERATING COMPANY, 520, 890 West Pender Street, Vancouver 1; mine office, Box 69, Stewart.

METALS: Copper, silver (producton shown in Table I).

DESCRIPTION:

The detailed geology of the Granduc area has been described in other Departmental reports, but in summary, the mineral occurrence is within a cataclasite zone in a mixed biotite hornblende and hornblende gneiss rock succession which is overlain on the east by easterly dipping volcanic conglomerates, thick pillow volcanic units, and minor intercalated sedimentary rocks. It is about 3 miles east of the easterly contact of the Coast Plutonic Complex.

Chalcopyrite, along with pyrite, pyrrhotite, and sphalerite in a gangue of quartz and country rock, occurs in streaks, blebs, and irregular massive lenses within a lenticular, mylonitic textured zone in a tactile-gneiss sequence. The ore zone extends at least 2,500 feet vertically and 4,000 feet laterally.

WORK DONE:

The mine and the concentrator operated continuously on a three-shift, seven-day basis throughout the year. The mining method is a trackless sublevel caving system. The transverse sublevel system was phased out in favour of multilongitudinal sublevel development due to increase width of waste bands in the C orebody. Two independent ramp systems serve the No. 1 and 2 ore blocks.

An auxiliary emergency escape way was provided from the No. 2 block to the 3100 level. Two new portals at 2,810 and 2,930 feet elevations were collared in the hangingwall and were developed to connect with the mine ramp system.

Production was about 50 per cent from the No. 1 block, 20 per cent from the No. 2

block, and the remainder from development ore in the No. 1 and No. 2 blocks. Part of the B_1 and B_2 ore zones in the No. 1 block above the 3100 level was developed as a block caving stope. Undercutting was in progress at year end but the success of it will not be known until some time in the new year.

Part of the A ore zone in the No. 1 block above the 2660 level was planned as a mechanized cut and fill stope and development to this effect was initiated at year end.

Total underground access development during the year was 58,920 feet. Drifts, crosscuts, and service ramps for trackless equipment was 50,971 feet. Drifts and crosscuts for track type of equipment amounted to 1,727 feet. Slot raising at end of production heading was 3,005 feet, while miscellaneous raising was 567 feet. Alimak raise driving was replaced entirely by raise boring with a total footage of 2,260 feet. Miscellaneous excavations in waste amounted to 168,515 cubic feet. Underground diamond drilling continued throughout the year with a total of 34,377 feet.

The No. 1 ore zone caved through to the surface near the Granduc fault. A concrete diversion dam was built above the cave to divert the spring runoff from the cave area. The main ventilating fresh-air intake at the 3200 level was redesigned and extended vertically to eliminate the plugging of it by snow drifting which had caused some problems earlier in the year.

The fresh-air intake capacity at the 3200 level remained near 465,000 cubic feet per minute which was assisted by natural ventilating pressure from the 2600 level Tide tunnel. Fan installation at the Tide portal was not completed due to delivery delays of components.

Total manpower at December 31, 1972 was 719, including contractors. Of this 327 were employed underground (including staff) and 392 were employed on surface (including mill). Training school for underground trackless equipment was continued.

During 1971 magnetometer and electromagnetic surveys were flown utilizing a helicopter around, and in the vicinity of, Granduc Mountain.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 34, 35; Assessment Report 3739.

TED, RAY (No. 38, Fig. G)

LOCATION: Lat. 56° 32' Long. 130° 15' (104B/9)
SKEENA M.D. At approximately 5,000 feet elevation at the headwaters of Sulphurets and Mitchell Creeks, east of Unuk River.

CLAIMS: TED, RAY, RAN, PATTY, MITCH, totalling 75.

ACCESS: By helicopter from Stewart, 40 miles.

OWNER: GRANDUC MINES, LIMITED, 2009, 1177 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION: Chalcopyrite with minor molybdenite occurs in schistose silicified, pyritized, and sericitized clastic Lower Jurassic volcanic rocks in a structurally complex area of doming, faulting, and plutonism.

WORK DONE: Eight trenches, 103 cubic yards on Patty 4 and 5, Ran 42, and Mitch 11.

(104B/9W)

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1968, pp. 44-46; *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 36.

KAY (No. 39, Fig. G) By E. W. Grove and B. M. Dudas

LOCATION: Lat. 56° 37' Long. 130° 28' (104B/9W)
SKEENA M.D. Between 3,500 and 3,700 feet elevation along Eskay Creek on the east slope of Prout Plateau, 1.5 miles east of Tom Mackay Lake.

CLAIMS: KAY 1 to 18, TOK 1 to 22.

ACCESS: By floatplane and helicopter, about 55 miles northwest of Stewart or by helicopter about 24 miles from the Stewart-Cassiar Highway.

OWNER: STIKINE SILVER LTD., 705, 850 West Hastings Street, Vancouver 1.

METALS: Silver, gold, zinc, lead.

DESCRIPTION:

The general geology of the Tom Mackay Lake area has been briefly described in Geology, Exploration, and Mining in British Columbia, 1970, pages 64 and 65. Since 1932 exploration in this area has uncovered sulphide mineralization at a number of locations along a strike length of about 5 miles. Much of this mineralization is localized within or near the northeasterly trending Eskay Creek shear zone (Ann. Rept., 1953, p. 88). The mineralized zone currently undergoing development, known as the 22 open cut, lies immediately west of Eskay Creek and appears to represent a northerly trending offset of the main shear zone. The 22 open cut shear crudely parallels local stratigraphy and is largely confined to an irregular 50-foot-wide quartz pebble conglomerate member. Sulphide mineralization uncovered in 1971 and 1972 occurs as lenses which appear to be restricted to *en echelon* brecciated cobble or boulder units within the pebble conglomerate.

Early work in the 22 open cut zone indicated that the mineralization comprised isolated patches or stockworks of sulphide-bearing quartz veinlets and stringers. In 1971, on the 40th anniversary of Mr. T. S. Mackay's involvement with the property, one of the stockwork zones was opened to depth revealing massive sulphide mineralization. This material consists mainly of light to dark brown sphalerite and forms the matrix for the brecciated cobble and boulder conglomerate. Tetrahedrite is disseminated throughout the sphalerite and the massive sulphide lens is also cut by younger tetrahedrite-bearing quartz veinlets, forming a zone of polyphase deposition.

A shipment of hand-sorted material from the 22 open cut in 1971 weighed about 1.67 tons and assayed: silver, 142.45 ounces per ton; gold, 0.194 ounce per ton; zinc, 2.8 per cent; and lead, 1.9 per cent. Work on the property during 1972 consisted mainly of deepening and extending the old open cuts along the breccia zone.

WORK DONE: Extensive trenching was carried out between June 15th and September 23rd. Some 42 cuts, varying in length from 20 feet to 170 feet were completed with a backhoe and front-end loader. The assay values for silver varied from 11.48 to 146.80 ounces per ton in 22 cuts over a length of 1,600 feet. Heavy supplies were delivered on trucks to a point east of the property on the Stewart-Cassiar Highway, and airlifted by helicopter to the mine.

(104B/10)

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1953, p. 88; *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, pp. 64, 65; 1971, p. 36.

PINS (No. 58, Fig. G)

LOCATION: Lat. 56° 31′ Long. 130° 49′ (104B/10)
LIARD M.D. Property straddles a ridge between two forks of Snippaker Creek about 12 miles south-southeast of the junction of Snippaker Creek and Iskut River, at approximately 4,200 feet elevation.

CLAIMS: PINS 1 to 40.

ACCESS: By helicopter from Snippaker Creek airstrip, 2.5 miles.

OWNER: COBRE EXPLORATION LIMITED, 1400, 1030 West Georgia Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: Andesitic to rhyolitic Triassic volcanic flows are intruded by feldspar porphyry dykes and small stocks. Chalcopyrite and malachite occur as disseminations in altered andesite at one locality; a large geochemical anomaly is present in the adjoining covered area.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet covering Pins 3 to 12; geochemical survey, 146 soil samples and 27 rock samples (of these, 110 soil samples and all 27 rock chip samples were analysed).

REFERENCE: Assessment Report 3982.

TAMI, KIM (No. 59, Fig. G)

LOCATION: TAMI
Lat. 56° 35.5′-37′ Long. 130° 50′-52.5′ (104B/10W)
KIM
Lat. 56° 31.5′ Long. 130° 42.5′ (104B/10W)
LIARD M.D. Six miles (Tami) and 14 miles (Kim) south of junction of Snippaker Creek and Iskut River, 88 air-miles south of Telegraph Creek.

CLAIMS: TAMI 1 to 36, KIM 1 to 25, 27, 29.

ACCESS: By helicopter from Eddontenajon Lake, 80 air-miles.

OWNER: GREAT PLAINS DEVELOPMENT COMPANY OF CANADA, LTD., 736 Eighth Avenue SW., Calgary, Alta.

METAL: Copper.

DESCRIPTION: The area is underlain by Triassic (?) (*Geol. Surv., Canada,* Map 9-1957) volcanic and sedimentary rocks. The geochemical programme was initiated to follow up a reconnaissance stream silt anomaly. The anomalies appear to coincide with contacts between the country rocks and syenitic intrusions.

WORK DONE: Geochemical soil survey, 1,360 samples covering all claims.

REFERENCE: Assessment Report 3981.

INEL (No. 64, Fig. G)

LOCATION: Lat. 56° 41.3' Long. 130° 56' (104B/10W)
LIARD M.D. Between 3,500 and 6,500 feet elevation on the east side of Bronson Glacier, south of the confluence of Bronson Creek and the Iskut River, 60 miles northwest of Stewart.

CLAIMS: INEL 7 to 72.

ACCESS: By helicopter from the Snippaker Creek airstrip, 8 miles, or from Stewart.

OWNER: Skyline Explorations Ltd.

OPERATOR: TEXASGULF, INC. (formerly Texas Gulf Sulphur Company), 701, 1281 West Georgia Street, Vancouver 5.

METALS: Copper, zinc, molybdenum, gold, silver, lead.

DESCRIPTION: Andesitic to rhyolitic volcanic flows, breccias, and minor sedimentary rocks lie immediately east of main contact with Coast Plutonic Complex intrusions. Country rocks are generally deformed, altered, and obscured by gossan. Mineralization includes deformed concordant sulphide lenses, and scattered lode mineralization. Pyrite predominates, with sphalerite, chalcopyrite, and galena prominent. Pyrrhotite, magnetite, arsenopyrite, molybdenite, chalcocite, and bornite are present. Native gold was observed with sphalerite in fractures.

WORK DONE: Geological mapping, 1 inch equals 100 feet on centre of property during 1971-1972.

REFERENCE: Assessment Report 3980.

SHAN (No. 57, Fig. G)

LOCATION: Lat. 56° 39' Long. 130° 50.5' (104B/10W)
LIARD M.D. At approximately 3,500 feet elevation on the east side of Snippaker Creek, 3 miles south of the Iskut River.

CLAIMS: SHAN 1 to 4, 6, SNIP 1 to 5, 9 to 15, 17, 18, 20, 22, 26 to 28.

ACCESS: By aircraft from Dease Lake, 120 miles.

OWNER: SKYLINE EXPLORATIONS LTD., 1212, 1177 West Hastings Street, Vancouver 1.

METALS: Zinc, copper.

DESCRIPTION: The showing consists of an area of zinc and minor copper mineralization over a strike length of approximately 2,000 feet and a width of 400 to 600 feet. The mineralization consists of sphalerite and chalcopyrite in an actinolite-magnetite-garnet skarn zone along a limestone-granodiorite contact.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet and 1 inch equals 40 feet covering Snip 1, 2, 5-8, 11, 12, 17, and 18; geochemical soil survey, 224 samples covering same claims; trenching, 95 cubic yards on Snip 5 and 6.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1964, p. 18; Assessment Report 4140.

DIRK (KEN) **(No. 71, Fig. G)** By A. Panteleyev

LOCATION: Lat. 56° 52.2' Long. 130° 56' (104B/14E, 15W)
LIARD M.D. Between 3,500 and 5,500 feet elevation in the Forrest Kerr Icefield, 12.5 miles north of the Iskut River, northwest of Newmont (Hole) Lake.

CLAIMS: DIRK 1 to 324.

ACCESS: By helicopter from Bob Quinn Lake, approximately 30 miles or from Forrest Kerr landing strip, 5 miles.

OWNER: NEWMONT MINING CORPORATION OF CANADA LIMITED, 1230, 355 Burrard Street, Vancouver 1.

METALS: Copper, iron.

DESCRIPTION:

The Dirk claims include, in part, old showings known previously as the Ken or WD groups. The claim block is an extensive holding situated in mountainous terrain largely covered by a permanent snowfield.

Mississippian metamorphic, sedimentary, and volcanic rocks are unconformably overlain or faulted against sedimentary and volcanic rocks of probable Permian age. The Paleozoic rocks are overlain by Upper Triassic sedimentary rocks. A series of syenite porphyry dykes generally less than 30 feet wide intrudes the bedded rocks and localizes mineralization. The dykes are 'rhomb porphyries' with coarse-grained K-feldspar phenocrysts and occasional small grains of garnet in the matrix. Mineralization is a typical skarn association of bornite, chalcocite, chalcopyrite, magnetite, hematite, and pyrite with a calc-silicate assemblage near but not necessarily in limestones intruded by syenite porphyries. Mineralization is erratic and forms pods and lenses, some of which have high copper content and carry appreciable gold and silver.

Thorough geologic work by company geologists including the collection and submission of fossils for identification has added significantly to the understanding of stratigraphy in the region.

WORK DONE: Surface geological mapping, 1 inch equals 1,500 feet covering claims and adjoining areas and 1 inch equals 100 feet covering select areas; airborne magnetometer survey covering Dirk 1 to 300; ground magnetometer survey covering select areas; surface diamond drilling, six holes totalling 318 feet.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1963, p. 9; Assessment Report 4150.

TELEGRAPH CREEK 104G

BAM (No. 54, Fig. G)

LOCATION: Lat. 57° 12.6' Long. 130° 53' (104G/2W)
LIARD M.D. At approximately 5,000 feet elevation on the east side of Mess Creek, 3 miles southwest of Arctic Lake and 50 miles south of Telegraph Creek.

CLAIMS: GP 1 to 30.

(104G/3W)

ACCESS: By helicopter from Schaft Creek, 14.5 miles or by floatplane to Arctic Lake, thence 3 miles by foot.

OWNER: PHELPS DODGE CORPORATION OF CANADA, LIMITED, 404, 1112 West Pender Street, Vancouver 1.

METALS: Copper, silver.

DESCRIPTION: Tetrahedrite and minor chalcopyrite, pyrite, malachite, and azurite are found in fractured, Permian dolomitic limestones, chert breccias, and overlying Lower Jurassic sandstones.

WORK DONE: Reconnaissance geochemical soil and silt survey, 110 samples.

REFERENCE: *Minister of Mines, B.C.,* Ann. Rept., 1967, p. 30.

GC, HAB, BUY (STIKINE COPPER)

By A. Panteleyev

LOCATION: Lat. 57° 08′ Long. 131° 27′ (104G/3W)
LIARD M.D. At approximately 2,450 feet elevation at the headwaters of Galore Creek, a tributary of the Scud River which is a tributary of the Stikine River.

CLAIMS: GC, HAB, BUY, XGC, KENNCO GC, SK, totalling 252 claims and 39 fractions.

ACCESS: By Otter from Terrace to a landing strip at the property, 220 miles.

OWNER: Stikine Copper Ltd.

OPERATOR: HUDSON BAY MINING & SMELTING CO. LTD., Box 28, Toronto Dominion Centre, Toronto 1, Ont.

METAL: Copper.

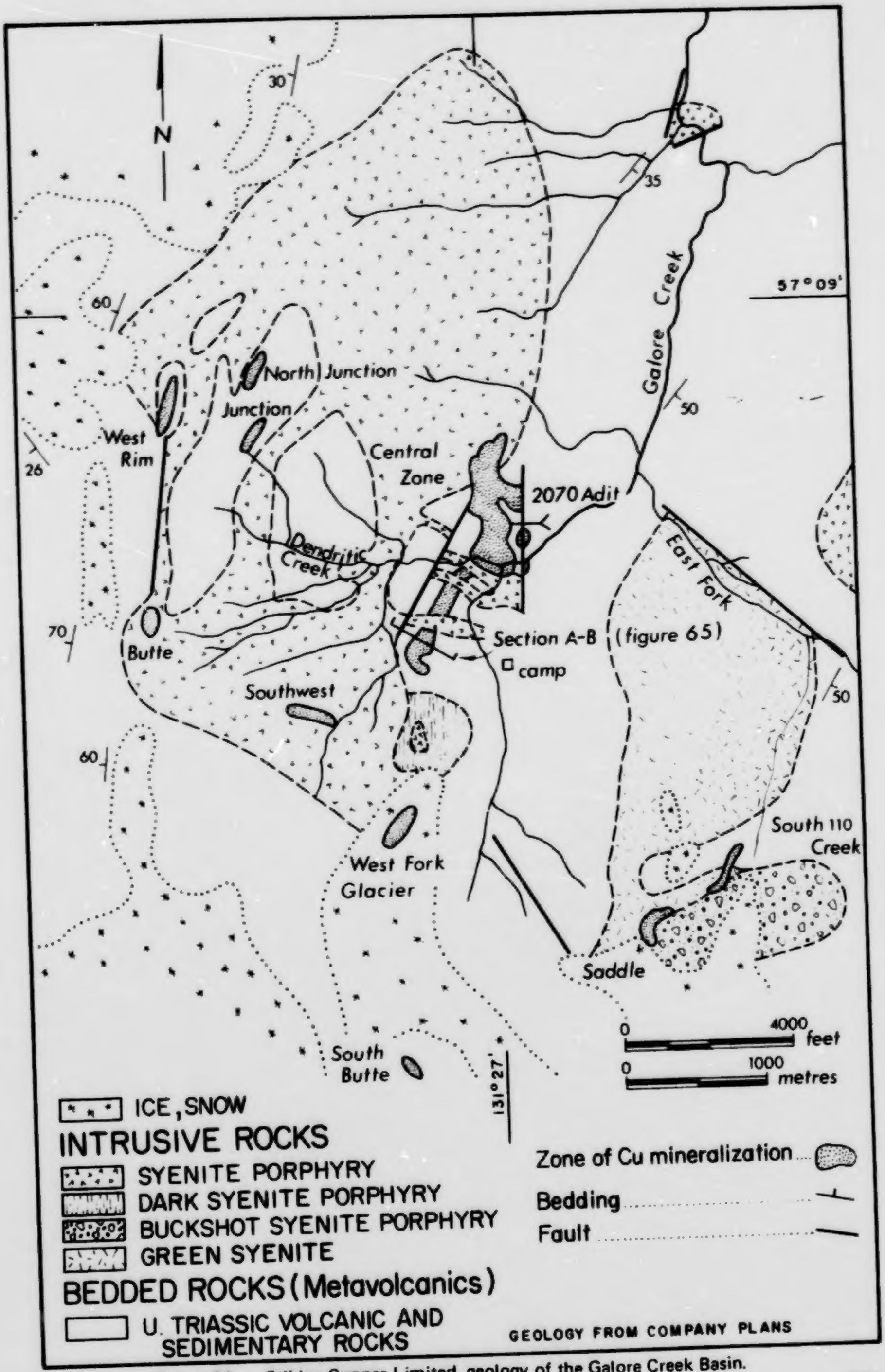
DESCRIPTION:

INTRODUCTION: Geology of Galore Creek basin and the geologic setting of the mineralized zones have been summarized by Jeffery (1965) and discussed in detail by Barr (1966). Mineralogical aspects have been studied by Allen (1966, 1971). The writer spent nine days in 1972 in preparation for a more detailed study in succeeding years.

The first period of exploration activity started in 1960 and ceased in early 1967 upon completion of underground work. Up to that time 174,422 feet of diamond drilling in 235 holes had been completed, of which 123,282 feet was done on the Central Zone. Underground work during the winter of 1966-67 included 2,480 feet of tunneling and 534 feet of drilling in the Central Zone (2070 adit) and 168 feet of tunneling on the North Junction Zone.

Exploration activity resumed in May after a five-year dormant period with Hudson Bay Mining & Smelting Co. Ltd. taking over as operator of the property. The drill programme utilized four drills and consisted of 50 vertical or nearly vertical and one angle hole totalling 34,214 feet. All drill holes were in the South Central Zone except for one in the North Junction Zone. The drilling was intended to provide more assurance on tonnage and grade in the area of the proposed initial pit. Holes were drilled to supplement previous geologic cross-sections and to provide new fences of holes between existing cross-sections at 350-foot intervals.

GENERAL GEOLOGY: The hiatus in exploration provided opportunity for company and other geologists to study the field data and conduct a number of academic


N
30
35
57° 09'
Galore Creek
60
North Junction
Junction
50
West Rim
26
Central Zone
2070 Adit
Dendritic Creek
East Fork
70
Section A-B (figure 65)
Butte
camp
Southwest
50
60
South 110 Creek
West Fork Glacier
Saddle
0
4000
feet
0
1000
metres
South Butte
131° 27'
ICE, SNOW
INTRUSIVE ROCKS
SYENITE PORPHYRY
DARK SYENITE PORPHYRY
BUCKSHOT SYENITE PORPHYRY
GREEN SYENITE
BEDDED ROCKS (Metavolcanics)
U. TRIASSIC VOLCANIC AND SEDIMENTARY ROCKS
Zone of Cu mineralization
Bedding
Fault

GEOLOGY FROM COMPANY PLANS

Figure 64. Stikine Copper Limited, geology of the Galore Creek Basin.

investigations. These studies have provided many new insights into geologic relationships at both a large and small scale.

Radiometric dating by White and coworkers have documented an Upper Triassic-Lower Jurassic intrusive and mineralizing event in the Galore Creek region. On the basis of a single date a Tertiary age is indicated for the Coast Intrusions to the west of the Galore Creek syenite intrusions. The following dates have been published (White, *et al.,* 1968).

	198±7 m.y.
Central Zone	189±9 m.y.
	174±9 m.y.
Copper Canyon (AMCO) stock	177±9 m.y.
Granite stock on Scud River	182±9 m.y.
Granodiorite, mouth of Scud River	44±2 m.y.

Petrologic investigations have resulted in revision of rock nomenclature. The 'junction,' 'lavender,' and parts of the 'younger' syenite have been shown to be metavolcanic or metasedimentary porphyroids. A major advance resulted from the recognition that the coarse syenite porphyry consisted of two distinct phases with crosscutting relationships. Together these two rock types, now called garnet syenite megaporphyry and epidote syenite megaporphyry, form the bulk of the Stikine Copper syenite. The garnet syenite megaporphyry and some of the epidote syenite porphyry were previously grouped together and referred to as 'intermediate' syenite and the age relationship with other syenites was not clear. The intrusive sequence of the main phases of syenite is now believed to be dark syenite porphyry followed by garnet syenite megaporphyry and finally epidote syenite megaporphyry.

Intruded rocks have been called by various names depending on their original character or their present appearance. The descriptive name 'mottled breccia' referred primarily to rocks with a relict fragmental texture but also included recrystallized rocks with coarse porphyroblastic fabrics as well as brecciated rocks. The intruded rocks are now classified as 'hornfels' and are described in terms of their mineralogy using the three most common constituents orthoclase, biotite, and garnet. This consistent classification allows gross lithology to be recognized on a mineralogical basis even though the original stratification in the rocks has been destroyed.

The surface expression and geometry of the Stikine Copper syenite complex is now better known (Fig. 64). The concept of a complex stock has been largely supplanted by one envisioning a sequential series of sheet-like syenite intrusions forming dykes and sills as well as small plugs intruding a comagmatic group of metasomatized volcanic rocks. The complicated geology in the Central Zone is sufficiently well understood that intercepts of mineralization and the major rock types were predicted with fairly good success during the most recent drill programme.

SOUTH CENTRAL ZONE

Introduction: Mineralization in the Central Zone is largely covered by overburden but good exposures are seen in a number of creeks. Natural exposures are supplemented by some trenching and an abundance of drill core. The south central portion is roughly that half of the Central Zone lying to the south of Dendritic Creek. It is a zone of complex geology underlain by a series of syenite intrusions in a section of essentially similar metavolcanic rocks. To the north of Dendritic Creek the northern segment of the Central

Zone is underlain by only a few thin intrusive units and lithology can be followed through the geologic cross-sections because of the presence of a number of marker horizons.

Together, the north and south segments form the Central Zone of mineralization. This zone is the largest of the ten known mineralized zones and has been traced for a length of about 6,500 feet and over widths of 300 to 1,300 feet. Mineralization is found mainly in metavolcanic rocks along the faulted eastern boundary of the syenite porphyry, often 1,000 feet or more from the contact. The zone is somewhat sinuous in plan but overall trends about north 20 degrees east and has a vertical to steep westerly dip.

Ore is exposed at surface south of Dendritic Creek but the zone is dissected by barren syenite intrusions, three of which outcrop as easterly trending dykes as shown on Figure 64. North of Dendritic Creek the mineralization is more continuous but has about a 10-degree rake toward the north and is about 400 feet below surface at the northern limit of the zone. Mineralization of ore grade appears to be terminated at depth by a subhorizontal garnet syenite megaporphyry sheet. However, a limited amount of drilling below this body reveals good mineralization and favourable rock alteration (Fig. 65). Additional drilling may well prove more ore at depth.

Geology: Geology and mineralization of a geologic cross-section from the South Central Zone are shown on Figure 65.

The intruded rocks are medium and coarse-grained porphyroblastic hornfels (porphyroids) and skarn derived by recrystallization and metasomatism of lithic tuffs or volcanic sandstones, crystal tuffs, volcanic flows, flow breccias, and trachyte sills. The mineralogical assemblage consists of three diagnostic components; orthoclase, biotite, and garnet in addition to the following: anhydrite, apatite, gypsum, sulphides, iron oxides, epidote, calcite, chlorite, sericite, and lesser plagioclase, diopside, sphene, and rare clay minerals and fluorite. The mineralogy is believed to reflect the original composition of the intruded rocks.

Mineralogical differences in addition to rock textures can be used to decipher depositional units and individual beds. Figure 65 shows one such unit composed of crystal and lapilli tuffs, breccias, and intercalated trachyte flows or sills. This unit is distinguished by a marked preponderance of garnet-bearing orthoclase alteration and the intercalation of flows or sills and coarse volcaniclastic debris. It contrasts strongly with the overlying biotite hornfels derived from more even and fine-grained epiclastic or pyroclastic rocks. The beds apparently dip and thicken eastward. If the assumption is made that magnetite is preferentially developed in certain strata, a similar eastward dip can be inferred for the magnetite-rich chloritic biotite hornfels seen near surface in drill holes 86, 239, 236, etc.

Intrusive rocks in the drill core examined are mainly dark syenite porphyry and garnet syenite megaporphyry. Epidote syenite megaporphyry was recognized in only two small dykes in the cross-section but a thick, northerly dipping dyke outcrops just to the north of the cross-section (Fig. 64). Dark syenite porphyry is apparently the earliest intrusive porphyry and in places is extensively brecciated, faulted, altered, and mineralized along with the intruded rocks. The porphyry forms a series of flat-lying sheets with coalescing and branching members that form sills as well as dykes. Dark syenite porphyry has a northerly dip and thus on Figure 65 the relative displacement of the faulted segments is greatly exaggerated when projected onto the plane of the cross-section.

Garnet syenite megaporphyry forms a subhorizontal intrusion that underlies most of the South Central Zone. The porphyry outcrops just south of Dentritic Creek and is intruded there by epidote syenite megaporphyry. The garnet syenite superficially resembles epidote syenite megaporphyry but has more abundant and evenly distributed andradite garnet (about 3 per cent), less epidote, and more abundant mafic minerals. In thin section garnet syenite is considerably more altered than epidote syenite megaporphyry and has biotite pseudomorphous after hornblende and strong sericitization of the feldspars. In addition to the above, numerous small dykes of unclassified porphyries, fine-grained syenites, and basic volcanic rocks are seen in the drill holes.

Structural geology is dominated by three elements – faults, breccia zones, and a near-surface fracture cleavage. Faults are interpreted to be steep and are closely spaced. The densest array of faults is in the centre of the cross-section coincident with the zone of best mineralization. Breccias are associated with fault zones. Some mixing of rock types and transport of fragments are evident but the breccias are thought to be tectonic rather than intrusive. Intrusion breccias and zones of fluid streaming are important in other parts of the Central Zone but were not recognizd in the drill holes examined.

A distinctive, closely spaced, subhorizontal fracture cleavage sometimes referred to as 'poker chip cleavage' or 'sheet fracture' (Allen, 1971) is observed in all drill core from surface to depths of about 600 to 700 feet. The fractures are, in detail, subparallel, splaying, discontinuous hairline breaks filled with gypsum. They were formed relatively late for they crosscut all silicate and ore minerals (Plate XIX). The cleavage is developed in all types of hornfels; is poorly developed in some portions of dark syenite porphyry but is absent in all the younger syenites and basic dykes.

The start of gypsum in drill holes is an important datum commonly called the 'gypsum line' because it signifies the beginning of cohesive rock and provides for good core recovery during drilling. The depth of the 'gypsum line' varies considerably but in the holes examined ranged from about 350 to 550 feet. Above the 'gypsum line' groundwater circulation has removed the gypsum and the rock crumbles into friable, shattered debris or thin flakes. Below the 'gypsum line' anhydrite is present throughout the hornfels and occasionally shows evidence of at least partial hydration. Hydration of anhydrite has been used to explain the development of the fracture cleavage (Allen, 1971). Other mechanisms suggested for the formation of sheet fractures include release of magmatic pressures and hydraulic fracturing but the origin is yet to be resolved.

Mineralization: Mineralization consists of disseminated, replacement, and fracture filling sulphides with an overall chalcopyrite to bornite ratio of about ten to one. The main minerals are chalcopyrite, pyrite, bornite, magnetite, and hematite with lesser amounts of sphalerite. Minor amounts of galena, primary chalcocite, and molybdenite are present and traces of tennantite, native silver, and gold have been reported.

Ore grades appear to be localized by both structural and lithologic controls. Permeability was probably the main physical constraint during sulphide deposition. The best mineralization is in coarse granoblastic hornfels within or adjoining breccia zones enclosed by steep, closely spaced faults. The central spine of faulting and brecciation is a core about which the enveloping mineralization is zoned in response to physiochemical conditions during sulphide deposition. The shape and breadth of the zone was governed

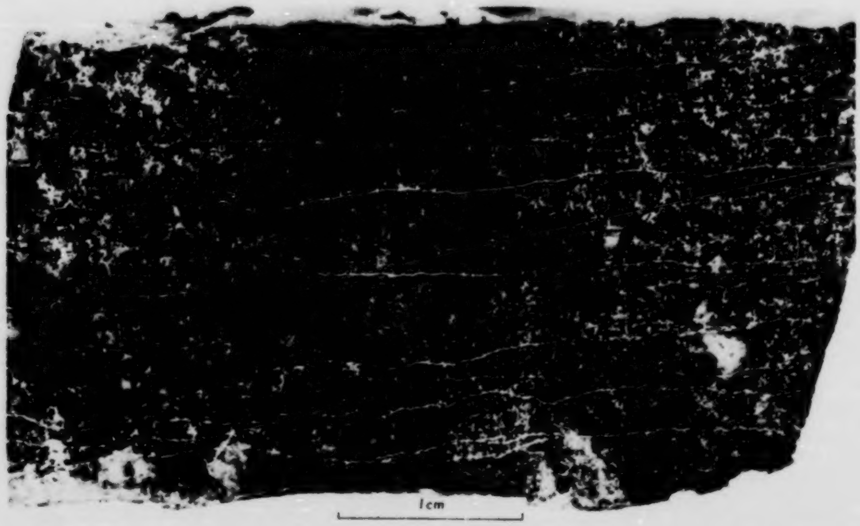


Plate XIXA. Stikine Copper Limited. Mineralized biotite orthoclase hornfels with fracture cleavage or 'sheet fracture' containing gypsum. The disseminated, light grey, diffuse grains are sulphide minerals.

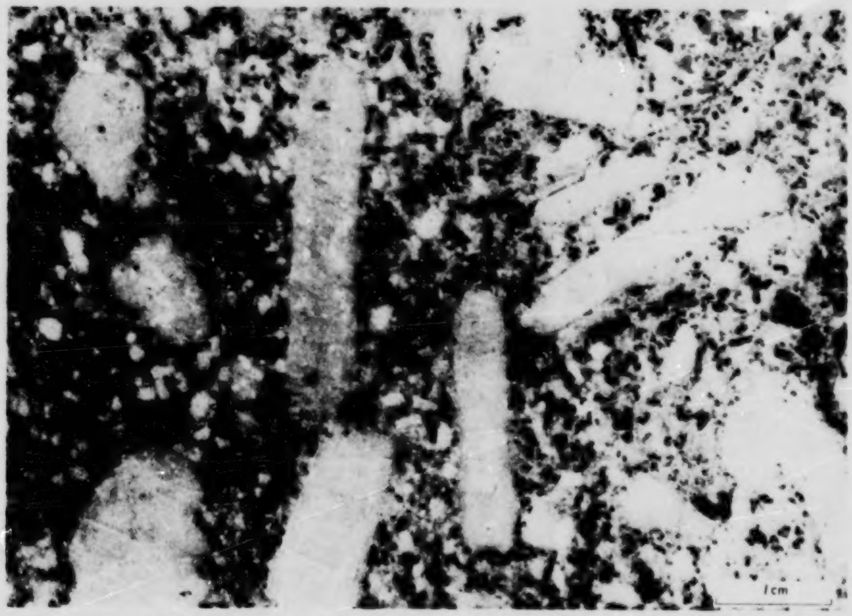


Plate XIXB. Stikine Copper Limited. Epidote syenite megaporphyry with poikilitic laths of K-feldspar and smaller crystals of plagioclase (oligoclase), hornblende, biotite, epidote, and minor garnet in a microcrystalline matrix of plagioclase, K-feldspar, sericite, and minor chlorite, calcite, sphene, and apatite.

by permeability of the intruded rocks with mineralization favouring the porous, volcaniclastic units.

Mineralization in the syenite porphyries is generally weak. The oldest syenite porphyry (dark syenite) is, in places, extensively brecciated, altered, and mineralized. The higher copper grades are due to high bornite to chalcopyrite ratios. The dark syenite was intruded as dykes or sills, was faulted, brecciated, and altered to a typical garnet-bearing orthoclase-biotite assemblage and then mineralized. It is significant that good mineralization is found in only the most highly fractured central portion of the mineralized zone while elsewhere dark syenite porphyry is relatively weakly altered and mineralized.

Garnet syenite megaporphyry contains only a little pyrite and traces of chalcopyrite although good mineralization is developed along its upper and lower contacts. This relation suggests that garnet syenite megaporphyry was not extensively fractured and acted as a dam to mineralizing solutions. Epidote syenite megaporphyry and the younger, fine-grained syenite dykes are generally barren or mineralized with small amounts of pyrite. The relationship of syenites to ore may well prove to be that dark syenite porphyry is a premineralization phase of syenite while the garnet syenite is an intramineral intrusion and the epidote syenite porphyry and younger intrusions are all post-ore and possibly post-mineralization phases.

Mineralization at Stikine Copper has been classified by many as porphyry copper type. However such a designation presents a number of problems in view of the many characteristics typical of pyrometasomatic deposits. Perhaps the classification problem can be resolved if one remembers that there is a close genetic relationship in many porphyry copper deposits with skarn mineralization and that porphyry type and skarn mineralization represent only different sites and environments for deposition of ore minerals from the same hydrothermal fluids. In this respect the Galore Creek deposits are very similar to those at Copper Mountain and Ingerbelle.

WORK DONE: Surface workings mapped; surface diamond drilling, 51 holes totalling 34,214 feet on Hab 1, 3, 15, GC 2 Fraction, XGC 1 Fraction, 32, and 110.

REFERENCES:

Jeffery, W. G., Geology of Upper Galore Creek, *Minister of Mines, B.C.*, Ann. Rept., 1965, pp. 19-29; Barr, D. A., 1966, The Galore Creek Copper Deposits, *C.I.M.*, Bull. 59, pp. 841-853; *C.I.M.*, Trans., Vol. LXIX, pp. 251-263; Allen, D. G., 1966, Mineralogy of Stikine Copper's Galore Creek Deposits, *U.B.C.*, unpublished M[illegible] thesis; Allen, D. G., 1971, The Origin of Sheet Fractures in the Galore Creek C[illegible]r Deposits, British Columbia, *Can. Jour. Earth Sc.*, Vol. 8, pp. 704-711; White, W. [illegible] Harakal, J. E., and Carter, N. C., 1968, Potassium-Argon Ages of Some Ore Depos[illegible] British Columbia, *C.I.M.*, Bull., Vol. 61, pp. 1326-1334; *C.I.M.*, Trans., Vol. LX[illegible]63-371.

HICKS (No. 40, Fig. G)

LOCATION: Lat. 57° 17'-20.7' Long. 131° 00.5 [illegible]' (104G/6E)
LIARD M.D. Between 2,800 and 4,000 [illegible]t elevation on Hickman Creek at junction with Schaft Creek, 4 [illegible]iles south-southwest of Telegraph Creek.

(104G/6E, 7W)

CLAIMS: BOB 1 to 89.

ACCESS: By caterpillar road from the Schaft Creek air strip, 2 to 5 miles.

OWNER: PHELPS DODGE CORPORATION OF CANADA, LIMITED, 404, 1112 West Pender Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Copper mineralization consisting of chalcopyrite and bornite occurs as disseminations in serpentinized basalts west of Hickman Creek and rarely in fine-grained volcanic flows or tuffs east of Hickman Creek and as massive fracture filling in shears in basaltic andesites along the south end of the property on the east side of Hickman Creek.

WORK DONE: Topographic mapping; surface geological mapping (reconnaissance and/or detailed), 1 inch equals 400 feet covering most of the claims; reconnaissance induced polarization survey, 3.35 line-miles covering (in part) Bob 15-24, 28, 30, 32, 34-51, 53, 55, 57, and 58; reconnaissance geochemical survey, 63 samples covering Bob 4-6, 17, 18, 29, 30, 41, 42, 53-56, 61, 62, 78, and 79; road construction, 2.5 miles (east side of Hickman Creek south from the Liard Copper claim boundary); trenching, 516 feet (rock plus miscellaneous earth trenching) on Bob 49, 51, and 55; surface diamond drilling, one hole totalling 395 feet on Bob 55.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 38.

SNO, BIRD (LIARD COPPER); NABS (PARAMOUNT) (No. 76, Fig. G)

By A. Panteleyev and B. M. Dudas

LOCATION: Lat. 57° 21′ Long. 130° 56′ (104G/6E, 7W)
LIARD M.D. Thirty-eight miles south of Telegraph Creek, east of the junction of Hickman Creek with Schaft Creek, between elevation 3,000 and 4,000 feet.

CLAIMS: SNO, BIRD, NOV, ID, GAV, BUD, PIT, SUE, ASH, WIN, RUM, VON, EMU, NABS, BB, MV, JMP, BARB, A, MESS, totalling appoximately 620.

ACCESS: By air from Terrace; Trans Provincial Airlines maintained scheduled flights three times weekly from Terrace.

OWNERS: H[illegible] Operating Company, Liard Copper Mines Ltd., and Paramount M[illegible]g Ltd.

OPERATOR: [illegible]A OPERATING COMPANY, 2009, 1177 West Hastings Street, [illegible]ouver 1.

METALS: C[illegible]lybdenum.

DESCRIPTION:

A detailed description is [illegible]n in Geology, Exploration, and Mining in British Columbia, 1970, pages 49 to 57.

The apparent age of m[illegible]ralization has been determined to be 182±5 m.y. (Lower Jurassic).

A composite sample of [illegible]mineralized biotite hornfels from the north-central portion of the mineralized zone ([illegible]ond-drill hole 52 – 370 to 380 feet) was dated using the K-Ar method (analysis at the University of British Columbia). Analyses were performed on a whole rock specimen of biotite hornfels (originally an ash tuff or volcanic sandstone) believed to have recrystallized synchronously with the mineralization. The whole rock specimen was beneficiated by the removal of much silica and carbonate gangue in order to up-grade the biotite content to about 25 per cent. Mineral separates could not be prepared because of the fine-grained nature of the hornfels and the severe alteration of mafic minerals in the associated intrusive rocks.

WORK DONE: Between June 2nd and August 10th one wireline diamond drill drilled nine holes (8,368 feet) on the Liard property and one hole (582 feet) on the Paramount property. This brings the total drilling since June 1968 to 70 holes (83,147 feet) on the Liard property and nine holes (8,691 feet) on the Paramount property. Surface geological mapping at scales of 1 inch equals 400 feet and 1 inch equals 200 feet was carried out on the Bud 1 to 10, 13 to 18, 25 to 34, 111, 112, and 119 to 124 claims. Three miles of road was constructed 92 miles, south extension of property; 1 mile, access to drill sites).

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.m., 1970, pp. 49-57; 1971, pp. 39, 40.

ARC (No. 56, Fig. G)

LOCATION: Lat. 57° 26′ Long. 131° 00′ (104G/6E, 7W)
LIARD M.d. Between 4,000 and 5,500 feet elevation on the east side of Schaft Creek, 31 miles south of Telegraph Creek.

CLAIMS: ARC 1 to 40; PORT 1 to 30, 35 to 44; ROSE 1 to 10, 31 to 34.

ACCESS: By caterpillar road from the Schaft Creek air strip, 6 to 8 miles.

OWNER: Columbia River Mines Ltd.

OPERATOR: PHELPS DODGE CORPORATION OF CANADA, LIMITED, 404, 1112 West pender Street, Vancouver 1.

METAL: Copper.

DESCRIPTION:

Mineralization consisting of chalcopyrite as fracture fillings and quartz veins with chalcopyrite and/or bornite and rare pyrite is developed in a quartz monzonite stock. The intrusion is a pink, medium to coarse-grained biotite-hornblende quartz monzonite of Upper Cretaceous to Lower Tertiary age that intrudes Upper Triassic andesite flows and pyroclastic rocks.

Copper mineralization is widespread but low grade and discontinuous. It is best developed in northwesterly trending fracture, shear, and fault zones. Hydrothermal alteration of the quartz monzonite is only weak and is probably deuteric in origin. A local pink to reddish colouration is apparently caused by hematitic staining rather than K-feldspar.

Minor chalcopyrite, bornite, and chalcocite occur erratically in the volcanic rocks and some increase in chalcopyrite with attendant copper carbonate staining was noted along the quartz monzonite-volcanic contact.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering most of the property; induced polarization survey, approximately 4 line-miles covering all or parts of Arc 11-14, 23-28 and Rose 4-8, 10; geochemical survey, 44 soil samples and 59 rock samples; road construction, 4 miles (east side of Schaft Creek extending northerly from north side of Paramount claims); trenching, 255 feet on Arc 20, 22, 24 and 1,120 feet on Arc 24; surface diamond drilling, one hole totalling 207 feet on Arc 24.

REFERENCES: Assessment Reports 2784, 3985, 3986.

RUN (No. 46, Fig. G)

By A. Panteleyev

LOCATION: Lat. 57° 18.6′ Long. 130° 54′ (104G/7W)
LIARD M.D. Between elevations of 2,400 and 4,750 feet on Mess Creek, 5 miles southeast of Schaft Creek landing strip.

CLAIMS: RUN 1 to 26, 31 to 42, 59 to 68, 71 to 90; TIA MARIA 1 to 8; HOT PUNCH 1 to 10.

ACCESS: By helicopter from the Schaft Creek landing strip, 6 miles.

OWNERS: Coseka Resources Limited (Run claims) and Northern Valley Mines Ltd. (Tia Maria and Hot Punch claims).

OPERATOR: PHELPS DODGE CORPORATION OF CANADA, LIMITED, 404, 1112 West Pender Street, Vancouver 1.

METALS: Copper, molybdenum.

DESCRIPTION:

Weak but persistent copper mineralization is found over a distance of about 6,000 feet in an iron-stained alteration zone that outcrops for at least 10 miles on the east side of Mess Creek. Jurassic and older volcanic rocks, minor tuffaceous sandstones, cherts, and feldspar porphyries of the same or younger age outcrop on the Run claim group. The few bedding attitudes seen indicate that the rocks strike north-south, dip steeply to the west, and appear not to be folded but occur as tilted panels between faults. Prominent northerly topographic linears parallel to the main Mess Creek faults and interconnected by northwest to northeasterly and east-west breaks are inferred to be faults.

The most abundant rock types are fine-grained andesite and andesitic ? feldspar porphyry whose colours range from grey-green to pink and brick red depending on the intensity of alteration and weathering. Many hand specimens and outcrops greatly resemble syenite and have been so described in a number of reports. However, K-feldspar rarely exceeds 3 per cent and occurs only as rare phenocrysts or thin rims on andesine plagioclase phenocrysts that form up to 60 per cent of the rock. The matrix is composed of fine-grained plagioclase, carbonate, sericite, accessory apatite, leucoxene, and up to 10 per cent opaque minerals. Some feldspar porphyries may be volcanic flows but most of the coarser rocks are dykes and sills. In outcrops the intrusive rocks are difficult to recognize because of weathering affects but the difference between the bedded rocks and intrusive feldspar porphyries is apparent in drill core (R. Beaton, personal communication). Other intrusive rocks noted include a thin dyke of fine-grained diorite or quartz diorite and a small stock of serpentinized peridotite. A number of similar serpentinized ultrabasic stocks are known elsewhere on Mess Creek where they appear to have been emplaced along faults and fault intersections.

Alteration of two main types is widespread but generally weak. One type is a prophylitic assemblage with chlorite, sericite, epidote, iron oxides, and pyrite and the other is a carbonate-rich propylitic subfacies in which the rock is bleached with ferroan dolomite or ankerite and sericite as the main alteration minerals. In surface exposures alteration affects are augmented by those of weathering and the circulation of groundwaters or heated waters from thermal springs. This low temperature, near surface alteration has caused additional sericitization and total replacement of magnetite by magnetic hematite (maghemite or gamma Fe_2O_3) which is characteristic of this environment. The rocks, therefore, have red staining in the matrix and appear syenitic. Outcrops are further coloured by a bright orange brown to light brown gossan consisting of an amorphous limonite derived from the breakdown of ankerite.

Mineralization consists of chalcopyrite and pyrite with traces of bornite and molybdenite. Some concentration of copper is apparent in about a 2,000-foot area in which alteration is more pronounced. Within this area good grades of copper and molybdenite have been intersected by a drill hole and appear to be structurally controlled by faulting and related brecciation.

WORK DONE: Topography mapped; surface diamond drilling, 1 inch equals 200 feet covering most of the claims; reconnaissance induced polarization survey, approximately 5 line-miles covering parts of Run 1-5, 10-12, and 41; geochemical survey, 176 samples (fill-in programme covering gaps left from previous survey); trenching, 26 holes totalling 10 feet each on Tia Maria 2; surface diamond drilling, four holes totalling 1,848 feet on Run 10, 21, and 41.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 39; Assessment Reports 3577, 3989, 4100.

ME, ROG (No. 47, Fig. G)

LOCATION: Lat. 57° 15'-17' Long. 130° 20.5'-25' (104G/8W)
LIARD M.D. Between 2,500 and 5,200 feet elevation 1 mile north of Ball Creek, 6 miles northwest of junction of Ball Creek with Iskut River.

CLAIMS: ME 1 to 18, ROG 1 to 40, TARA 1 to 27, MENT 1 to 7.

ACCESS: By helicopter from Burrage on the recently completed Stewart-Cassiar Highway.

OWNER: GREAT PLAINS DEVELOPMENT COMPANY OF CANADA, LTD., 736 Eighth Avenue SW., Calgary, Alta.

METALS: Copper, molybdenum.

DESCRIPTION: Volcanic and sedimentary rocks of Upper Triassic or other age (*Geol. Surv., Canada,* Map 9-1957) have been intruded by a granodioritic pluton. Alteration is extensive with considerable surficial oxidation and leaching prevalent. Pyrite-chalcopyrite-molybdenite mineralization has been reported in both the country rocks and intrusive material.

WORK DONE: Induced polarization survey, 7 line-miles and geochemical soil survey, 1,230 samples covering Tara 1-27.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 40; Assessment Reports 3189, 3978, 3979.

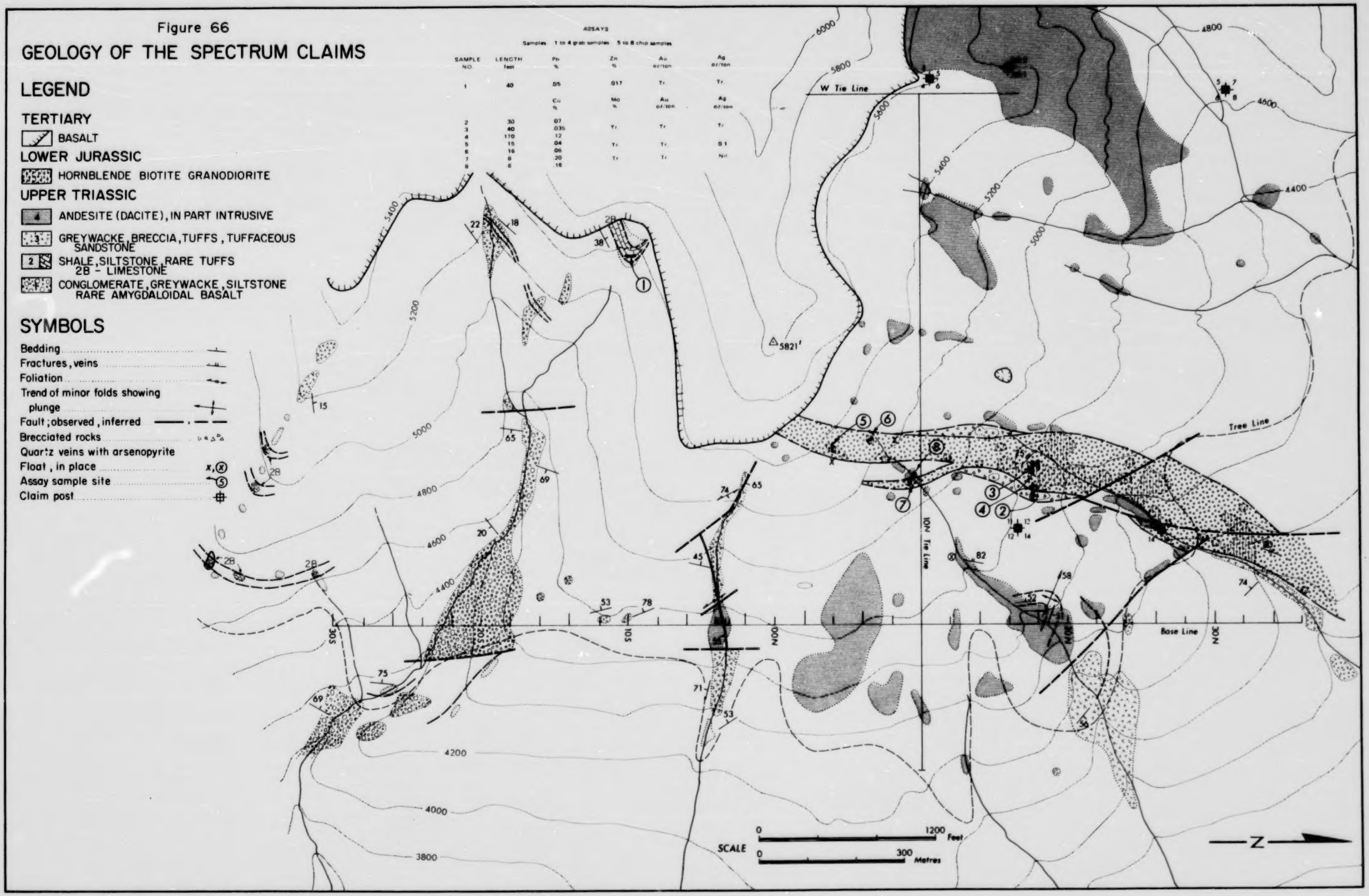


Figure 66

GEOLOGY OF THE SPECTRUM CLAIMS

LEGEND

TERTIARY

- BASALT

LOWER JURASSIC

- 5 HORNBLENDE BIOTITE GRANODIORITE

UPPER TRIASSIC

- 4 ANDESITE (DACITE), IN PART INTRUSIVE
- 3 GREYWACKE, BRECCIA, TUFFS, TUFFACEOUS SANDSTONE
- 2 SHALE, SILTSTONE, RARE TUFFS 2B - LIMESTONE
- 1 CONGLOMERATE, GREYWACKE, SILTSTONE RARE AMYGDALOIDAL BASALT

SYMBOLS

- Bedding
- Fractures, veins
- Foliation
- Trend of minor folds showing plunge
- Fault; observed, inferred
- Brecciated rocks
- Quartz veins with arsenopyrite
- Float, in place x, ⓧ
- Assay sample site ⑤
- Claim post

ASSAYS

Samples 1 to 4 grab samples 5 to 8 chip samples

SAMPLE NO.	LENGTH feet	Pb %	Zn %	Au oz/ton	Ag oz/ton
1	40	.05	.017	Tr	Tr.
		Cu %	Mo %	Au oz/ton	Ag oz/ton
2	30	.07	Tr.	Tr	Tr
3	40	.035			
4	170	.12			
5	15	.04	Tr.	Tr.	0.1
6	16	.06			
7	8	.20	Tr	Tr	Nil
8	6	.16			

6000
5800
5600
5400
5200
5000
4800
4600
4400
4200
4000
3800
W Tie Line
10N Tie Line
Base Line
30S
20S
10S
00N
10N
20N
30N
Tree Line
△5821'
2B
22
18
38
15
65
69
20
45
74
65
53
78
75
71
53
82
58
52
74
①
②
③
④
⑤
⑥
⑦
⑧
SCALE
0
1200
Feet
0
300
Metres
Z

(104G/9W, 10E)

SPECTRUM (No. 9, Fig. G)

By A. Panteleyev

LOCATION: Lat. 57° 41.3′ Long. 130° 29.5′ (104G/9W, 10E)
LIARD M.D. At approximately 4,500 feet elevation, 3 miles northwest of Kakiddi Lake, 15 miles west-northwest of Kinaskan Lake.
CLAIMS: SPECTRUM 1 to 4, 7 to 18, 21 to 50; OWL 60 to 65, 67 to 96.
ACCESS: From Eddontenajon by helicopter, 20 miles.
OWNER: Spartan Explorations Ltd.
OPERATOR: IMPERIAL OIL LIMITED, 500 Sixth Avenue SW., Calgary, Alta.
METAL: Copper.
DESCRIPTION:

The Spectrum claims were located in 1970 to cover an occurrence of porphyry-type mineralization associated with a granodiorite intrusion in Upper Triassic volcanic and sedimentary rocks. Indications of copper mineralization are widespread on easterly facing slopes forming part of the escarpment of Mount Edziza. The claims lie within a northerly trending belt of rusty weathering rocks exposed between treeline at approximately 4,500 feet and the base of the Late Cenozoic volcanic pile of Mount Edziza at an elevation of about 5,500 feet.

GEOLOGY: Geology of a portion of the Spectrum claims is shown on Figure 66.

Mesozoic bedded rocks within this area can be subdivided into four stratigraphic units on the basis of lithology. The three lowest formations are apparently conformable while the relationship of the fourth is not obvious although it is thought to overlie the other three formations unconformably. The Upper Triassic assemblage of the region has been described by Souther (1972). The conformable sequence mentioned above corresponds to his Unit 5 and possibly includes Units 6 and 7 whereas the unconformable ? unit is his Unit 8.

The basal unit in the exposed sequence (map unit 1) consists of conglomerate, greywacke, siltstone, and at least one amygdaloidal basalt flow member. The coarsest beds contain pebble and cobble-sized clasts consisting mainly of chert and some crystalline limestone with other rock fragments in a silt or mud matrix. Beds are commonly 2 to 5 feet thick but massive units of conglomerate as well as thinly bedded, graded siltstone or shale are present. This unit passes upward into about a 1,000-foot thick succession of mainly shale and siltstone interspersed with limestone beds and lenses and thin chert and greywacke members (map unit 2). Limestone beds are 5 to 10 feet thick and formed of bioclastic deposits containing abundant shell fragments and crinoidal stems. The overlying map unit 3 is a succession of sedimentary rocks composed of angular epiclastic and pyroclastic detritus. Composition of the fragments is highly varied but the clast size ranges mostly from sand to pebble. The deposits most often form beds of lithic breccia, grit, and tuffaceous sandstone but beds of lithic-crystal tuff and occasionally plagioclase-bearing crystal tuff are present. Some of the lithic-crystal tuffs have a peculiar light brown matrix that appears to be a mixture of mud and original volcanic glass. At least one bed of layered, air-fall rhyolite tuff is included in the sequence. Stratification is apparent in most fine-grained rocks and crossbedding was seen in some. Breccia units are often massive and stratification is evident only if limestone lenses or beds with limestone clasts are present.

Map unit 4 occupies the central and northwestern portion of the map-area and consists of grey porphyritic to microporphyritic andesite (to dacite ?). Outcrops are rusty weathering and massive with no recognizable strata. The formation is thought to overlie the three sedimentary formations unconformably on the basis of gross distribution of the rock type rather than any observed structural or stratigraphic evidence. Undoubtedly some of the unconformable appearance is due to the abundance of dykes, sills, and small irregular intrusions within this volcanic unit. The intrusive bodies are crystalline, fine-grained porphyritic rocks that are virtually indistinguishable from the host strata except for the presence of slightly coarser plagioclase crystals and a well-developed blocky jointing in outcrops. The rocks are probably hypabyssal intrusions and subvolcanic feeders of overlying flows.

The strata are folded into large open structures with gently dipping beds in the southwest and moderately to steeply east and westerly dipping beds in the centre of the map-area. No sense was made of the fold geometry. In two localities small folds with northwesterly plunging axes were mapped and may be indicative of the predominant structural trend.

Faults trend in two main directions – northerly and northwesterly. They have dissected the area into blocks that appear to have undergone vertical displacement but show very little evidence of lateral movement.

The stratified succession is intruded by a large northerly trending granitic dyke of Lower Jurassic age. This body outcrops over a length of at least 3,500 feet and widths up to 450 feet. It is a steep-walled body that has a sharp contact with the extrusive rocks and has evidently brecciated them over some of its length. The intrusion appears to splay and become thinner near its southern limit of exposure close to where it is covered by Miocene basalt flows. South of the basalt promontory a 20-foot thick sill may be a continuation of the main dyke.

The intrusion is composed of a grey to pink porphyritic rock with feldspar phenocrysts and has a crowded, somewhat seriate and occasionally weakly oriented texture. It is apparently intruded as a single mass although a younger phase may form a few thin dykes within the main intrusion or along its margins. The presence of a second phase is indicated by the distribution of a few thin dyke-like spines of blocky, jointed rock in highly fractured (cracked) zones of the main intrusion. These jointed rocks are very similar to the main rock type but display a deeper pink colouration, more equant feldspar phenocrysts, and possibly a higher proportion of hornblende to biotite. However, no well-defined contact between the two rock types was recognized.

The composition of the intrusive rocks is fairly uniform although texture and colour are somewhat varied. Characteristically the rock consists of phenocrysts of medium-grained K-feldspar, fine to medium-grained plagioclase, and lesser biotite in a very finely granular matrix of quartz and feldspar. Essential minerals in four representative samples from widely spaced localities showed very little deviation from mean values of 11.4 per cent quartz, 21.4 per cent K-feldspar, and 58.3 per cent plagioclase. Mafic minerals constitute an average of 6.5 per cent of the rock and consist of biotite with minor hornblende and chlorite. Accessory minerals including magnetite, sericite, apatite, epidote, calcite, and sphene constitute from 1 to 2 per cent of the rock while sulphide content varies from less than 1 to about 2.5 per cent and seems to have an inverse relation to magnetite content. The rock may, therefore, be classified as either a granodiorite or quartz-bearing monzodiorite and described as a hornblende-bearing biotite granodiorite porphyry.

Alteration zones are centred on the granodiorite intrusion. A central core of potassic alteration containing biotite, sericite, and a few small quartz and quartz-K-feldspar veins is found within the granodiorite to the south of about line 28 North on the survey grid. A biotite hornfels envelopes the intrusion across distances of 50 to 100 feet from the contact. Hornfelsic textures and the presence of biotite die out abruptly and relict primary textures and propylitic mineral assemblages are seen in peripheral rocks. Propylitic alteration is indistinguishable from deuteric alteration affects in the Upper Triassic volcanic unit but can be recognized by the presence of tremolite/actinolite, epidote, chlorite, sericite, and carbonate in specimens of granodiorite and the volcaniclastic rocks in the northern part of the map-area (north of survey line 28 North).

Gossans are widely associated with Upper Triassic volcanic rocks, as well as the granodiorite dyke and intruded rocks along its border, and the base of the Late Cenozoic volcanic flows. Oxidation of outcrops is superficial and has resulted in widespread but thin coatings of goethite on the rocks. Crackled zones within the granodiorite are light yellow in appearance due to local development of jarosite and supergene sericite and clay minerals. Leaching affects, however, are minimal as even surface samples from the jarositic zones contain pyrite and unaltered biotite grains.

MINERALIZATION: Porphyry-type copper mineralization, polymetallic quartz veins, and scattered occurrences of lead and zinc minerals are known on the property. Small amounts of pyrite and traces of chalcopyrite are dispersed throughout many of the rocks – particularly granodiorite, hornfels, and Upper Triassic andesites. The amount of pyrite increases in the area where granodiorite intrudes rock of the andesite unit. Here sulphide content is commonly 3 per cent and may reach 5 to 8 per cent whereas copper grades of 0.1 to 0.2 per cent can be found over a large area.

Mineralization in the granodiorite is present as disseminated and fracture-controlled pyrite with minor chalcopyrite and malachite while fracture fillings and rare disseminations of pyrite, pyrrhotite, and chalcopyrite are found in the intruded rocks. Fine-grained magnetite is often associated with sulphides or disseminated in the hornfelsic zones and sometimes borders quartz veinlets. Quartz veinlets are not abundant but can be found in both the granodiorite and intruded rocks. However, all quartz veins seen were barren of any copper or molybdenum sulphides. Molybdenum is known to be geochemically anomalous in the mineralized area, but no trace of molybdenite was seen in the course of the property examimation.

A number of polymetallic quartz veinelts up to 2 centimetres but usually less than 1 centimetre wide were noted in granodiorite outcrops, local debris, and andesite well removed from the intrusion or its contact. The veins contain rare grains to banded crusts of sphalerite, pyrite, arsenopyrite, and chalcopyrite and carry gold values. Two mineralogical specimens tested by semiquantitative spectroscopic methods returned a value of about 15 ounces per ton gold in one of the specimens.

Small amounts of sphalerite, galena, pyrite, and chalcopyrite can be found in a few of the recrystallized limestone beds and magnetite has formed in some of the calcsilicate zones in the southwestern quadrant of the map-area. Small ankeritic carbonate and quartz carbonate veins and gashes can be found in many locations throughout the property and occasionally carry sphalerite and galena.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 200 feet covering Spectrum 1-4, 7-16, and 27-30; ground magnetometer survey, 23.5 line-miles covering same claims; geochemical rock-chip survey, 150 samples covering same claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 41; Assessment Reports 2735 (geological), 3501 (induced polarization), 3866 (topographic); Souther, J. G., 1972, Telegraph Creek Map-area, British Columbia, *Geol. Surv., Canada*, Paper 71-44, 38 pp.

IN (No. 24, Fig. G)

LOCATION: Lat. 57° 31'-39' Long. 130° 51.5'-57' (104G/10W)
LIARD M.D. At approximately 2,800 feet elevation north of Mess Lake, between Schaft and Mess Creeks, about 25 miles south of Telegraph Creek.

CLAIMS: IN 1 to 8, 11 to 247; C 1 to 96.

ACCESS: By helicopter from Schaft Creek, 12 to 18 miles.

OWNER: HECLA OPERATING COMPANY, 2009, 1177 West Hastings Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Copper mineralization occurs at the contact between Hickman batholith granitic rocks and Upper Triassic, green-coloured, fragmental andesitic volcanic rocks. Structural geology appears dominated by northerly trending faults and northeasterly striking shears.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet and 1 inch equals 200 feet covering C 1-96; induced polarization and resistivity surveys, 12.4 line-miles covering In 1-4, 27-30, 35, 36, 53-56, 61, 62, 75-78, 83, 84, 101-104, 109, 110, 127-130, 135, 136 and C 10-14, 16, 33-38, 59, 61, 62; magnetometer survey, 36 line-miles covering C 1-96; geochemical soil survey, 1,069 samples covering C 1-96; trenching, 225 feet on C 14, 29, 37.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 58; Assessment Reports 3845, 3983, 3984.

DOK (No. 25, Fig. G)

LOCATION: Lat. 57° 31.5' Long. 131° 31.6' (104G/12E)
LIARD M.D. On Strata Creek 6 miles south of the Stikine River, 30 miles southwest of Telegraph Creek.

CLAIMS: DOK 1 to 6, 13 to 20, 24, 60; DON 1 to 12; PETE 1 to 8; THELMA 66 to 81; JON 1 to 24; JILL 1 to 6; GU 1 to 12; ELSA 1 Fraction; PR 1 to 20.

ACCESS: By helicopter from Schaft Creek, 20 miles or from Telegraph Creek, 32 miles.

OWNER: Empire Metals Corporation Ltd.

OPERATOR: THE SWISS ALUMINIUM MINING CO. OF CANADA LTD., Box 835, Station A, Vancouver 1.

METALS: Copper, molybdenum, lead, zinc.

(104G/12E)

DESCRIPTION: Copper mineralization occurs as malachite and azurite with minor chalcopyrite and chalcocite. The minerals occur in tabular bodies and discontinuous veins up to 2 feet wide and 100 feet long and as thin fracture fillings.

WORK DONE: Surface geological mapping, 1 inch equals 1,000 feet covering PR 1-20 and 1 inch equals 1,500 feet covering GU 1 to 12; surface diamond drilling, five holes totalling 2,680 feet on Dok, Don, Jon, Elsa, and Thelma claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 41; Assessment Reports 3846, 3847.

WALLY (No. 53, Fig. G)

LOCATION: Lat. 57° 37′ Long. 131° 43′ (104G/12E)
LIARD M.D. At approximately 1,500 feet elevation opposite Jacksons landing, Stikine River, 30 miles southwest of Telegraph Creek.

CLAIMS: WALLY 1 to 12.

ACCESS: By boat from Telegraph Creek, 35 miles.

OWNER: BART MINES LTD., 710, 475 Howe Street, Vancouver 1.

WORK DONE: Trenching, approximately 1,500 cubic feet on Wally 4, 6, 8, and 10.

LIM, BRAD (No. 21, Fig. G)

LOCATION: Lat. 57° 48′-50′ Long. 131° 41.5′-46′ (104G/13)
LIARD M.D. Between 2,000 and 3,000 feet elevation on Latimer Lake, north of the confluence of Chutine and Stikine Rivers, 25 miles west of Telegraph Creek.

CLAIMS: LIM, BRAD, totalling 52.

ACCESS: By helicopter from Telegraph Creek.

OWNER: Dennis W. Milburn.

OPERATOR: QUINTANA MINERALS CORPORATION, 1215, Two Bentall Centre, Vancouver 1.

DESCRIPTION: A low intensity geochemical anomaly occurs in an area of extensive overburden overlying Upper Triassic volcanic and sedimentary rocks.

WORK DONE: Line-cutting and magnetometer surveying covering 30 line-miles.

REFERENCE: Assessment Report 3641.

SPATSIZI RIVER 104H

CHRIS (No. 37, Fig. G)

By A. Panteleyev

LOCATION: Lat. 57° 42′ Long. 129° 50′ (104H/13E)
LIARD M.D. At an elevation of 5,000 feet approximately 6 miles southeast of Eddontenajon Lake, 5 miles south of Ealue Lake.

CLAIMS: CHRIS 1 to 42, MONEY 1 to 30, 32, 34, 46, 48, 40 to 50, 61, and 63.

(104H/13E)

ACCESS: By helicopter from Eddontenajon on the Stewart-Cassiar Highway, 7 miles.

OWNER: GREAT PLAINS DEVELOPMENT COMPANY OF CANADA, LTD.,
736 Eighth Avenue SW., Calgary, Alta.

METALS: Copper, molybdenum.

DESCRIPTION:

The Chris claims are situated on one of a number of young 'felsite or felsite porphyry' intrusions along the northern rim of a Late Mesozoic sedimentary basin that now forms the Skeena Mountains. Rusty zones with disseminated pyrite and indications of copper mineralization are commonly associated with these intrusions.

The property is underlain by chert pebble conglomerates, greywackes, and siltstones of probable Upper Jurassic to Lower Cretaceous age and feldspar porphyries that have been called 'felsites' probably because of their leucocratic, bleached appearance in outcrop. A feldspar porphyry intrusion was probably emplaced as a high level plug of andesitic composition and is cut by younger porphyry dykes with predominately east-northeast to east-southeast trends. Although the shape and dimensions of the main porphyry intrusion are difficult to define because rock exposure is confined to three branches of a northerly trending creek, an equidimensional plug at least 4,000 feet in diameter may be present.

The feldspar porphyry dykes display a porphyritic texture in which greenish, saussuritized plagioclase phenocrysts constitute about 30 to 35 per cent and chlorite-sericite-clay masses pseudomorphous after amphibole form about 15 per cent of the rock. Magnetite grains and small amounts of pyrite are present. The main mass of feldspar porphyry has a relict porphyritic texture in a pyritic quartz-sericite assemblage. No magnetite, chlorite, or any vestige of other mafic minerals remains. In the most intensely altered zones porphyritic textures are destroyed by fine-grained intergrowths of quartz, sericite, and clay minerals with up to 5 per cent or more pyrite and scattered fine grains of tourmaline. An average of 1 to 2 per cent disseminated fine-grained pyrite is seen in all the feldspar porphyries except the younger feldspar porphyry dykes. Rare grains of chalcopyrite are widespread in pyritic rocks and sphalerite and galena occur sporadically in carbonate gash veins.

Pyritic zones are marked by rusty outcrops of strongly altered or weathered rock. In detail outcrops and rubble vary in colour from chalk white to yellow or dark brown to reddish brown. Yellow gossan occurs over small areas and marks zones of jarositic and sericitic alteration. The zones may represent supergene breakdown of rocks with potassic alteration and at least one jarositic zone coincides with brecciated feldspar porphyry. Highly fractured rocks, such as in fault zones, are bleached to a chalky white or buff assemblage of quartz, sericite, and clays. Goethite is the most widespread limonite and forms deposits of limonite-cemented breccia (ferricrete) in creek beds and along creek banks. A white sludge (gypsum ?) is being deposited in many of the creeks.

Drill cores show that the pervasive alteration seen in outcrops is largely supergene and restricted to surface zones in which groundwaters are acidic due to the oxidation of pyrite. At shallow depths pervasive (hypogene) alteration is weak and bleached rocks with strong sericitic alteration are a few feet to tens of feet wide and are controlled by fracturing. The presence of sulphides and carbonate veins in surface exposures attests to the superficial nature of the oxidation and leaching. Trace amounts of covellite or chalcocite at very shallow depths are all the supergene sulphide that would be expected.

(104I/3W, 4E)

WORK DONE: Eight diamond-drill holes were drilled with a total footage of 3,017 feet. The drilling was done on Chris 1, 9, 11, and 12 mineral claims.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 60.

CRY LAKE 104I

PAT (No. 68, Fig. G)

LOCATION: Lat. 58° 11' Long. 129° 29' (104I/3W, 4E)
LIARD M.D. At the head of the Tanzilla River, 26 miles southeast of the town of Dease Lake.
CLAIMS: PAT 1 to 24.
ACCESS: From Dease Lake by helicopter, 26 miles.
OWNER: LORNE J. ELLIOTT, 704 – 33A Street NW., Calgary, Alta.
METAL: Copper.
DESCRIPTION: Chalcopyrite is disseminated in granitic rocks of the Hotailuh batholith.
WORK DONE: Geochemical survey, 113 samples during 1971.
REFERENCE: Assessment Report 3963.

WOLF (No. 51, Fig. G)

LOCATION: Lat. 58° 15.5' Long. 129° 28' (104I/3W, 6W)
LIARD M.D. At approximately 5,000 feet elevation east of Glacial Lake, 27 miles southeast of Dease Lake.
CLAIMS: WOLF 1 to 18.
ACCESS: By helicopter from Dease Lake, 27 miles.
OWNER: Kol Lovang.
OPERATOR: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.
DESCRIPTION: A fracture zone of limited extent in volcanic rocks contains subeconomic copper mineralization.
WORK DONE: Surface geological mapping, 1 inch equals 200 feet covering Wolf 1-16; geochemical soil survey, 297 samples covering Wolf 1-5, 14, and 16.

LOUISE (No. 62, Fig. G)

LOCATION: Lat. 58° 05' Long. 129° 46' (104I/4W)
LIARD M.D. At an elevation of 4,500 feet 6 miles northeast of the Stikine ferry on the Cassiar-Stewart Highway.
CLAIMS: LOUISE 1 to 18.
ACCESS: By helicopter from Dease Lake, 24 miles.
OWNER: LORNE J. ELLIOTT, 704 – 33A Street NW., Calgary, Alta.
WORK DONE: Geochemical soil survey, 300 samples during 1971.
REFERENCE: Assessment Report 3964.

CROWN (No. 42, Fig. G)

LOCATION: Lat. 58° 12.4′-14.8′ Long. 129° 59′ - 130° 00.5′ (104I/4W; 104J/1E)

LIARD M.D. At approximately 4,500 feet elevation 15 miles south of the south end of Dease Lake, north of Thenatlodi Mountain.

CLAIMS: CROWN 1 to 38.

ACCESS: By helicopter from Dease Lake, 16 miles to the southeast.

OWNER: UNION MINIERE EXPLORATIONS AND MINING CORPORATION LIMITED, 200, 4299 Canada Way, Burnaby 2.

METAL: Copper.

DESCRIPTION: A pyritic gossan has formed in intermediate Upper Triassic volcanic rocks intruded by small granodiorite and quartz monzonite bodies that are possibly related to the Hotailuh batholith.

WORK DONE: Surface geological mapping, 1 inch equals 900 feet covering Crown 7-22 and 29-38; magnetometer survey, 16.3 line-miles covering Crown 1-10 and 23-32; induced polarization and resistivity survey, 8.9 line-miles covering Crown 10, 12, 14, 16, and 31-38; geochemical soil survey, 428 samples covering Crown 1-18 and 23-38; surface diamond drilling, two holes totalling 995 feet covering Crown 14 and 33.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 44.

KAY, KING, KO (No. 69, Fig. G)

LOCATION: Lat. 58° 15′-18′ Long. 129° 53′-59′ (104I/5W)

LIARD M.D. Near Gnat Lakes 3 miles west of the Cassiar-Stewart Highway, 12 miles southeast of Dease Lake.

CLAIMS: KAY, KING, KO, BOX, totalling 89.

ACCESS: By the Cassiar-Stewart Highway to a point 2.7 miles south of the Tanzilla River bridge, then 3 miles by road suitable for four-wheel-drive vehicle.

OWNER: TANZILLA EXPLORATIONS LTD., 4, 558 Howe Street, Vancouver 1.

METAL: Copper.

DESCRIPTION: Chalcopyrite is disseminated throughout an altered, mylonitized zone in metavolcanic rocks.

WORK DONE: Geological mapping, 1 inch equals 400 feet; line-cutting, 9,200 feet; geochemical soil survey, 120 samples.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 45; Assessment Report 3973.

QUEEN (No. 26, Fig. G)

LOCATION: Lat. 58° 16.8′-21′ Long. 129° 59′ - 130° 12′ (104I/5W; 104J/8E)

LIARD M.D. At approximately 4,000 feet elevation covering Hluey Lakes, 10 miles south of Dease Lake.

CLAIMS: QUEEN 1 to 200.

(104I/5E)

ACCESS: By helicopter or winter road from Dease Lake.

OWNER: UNION MINIERE EXPLORATIONS AND MINING CORPORATION LIMITED, 200, 4299 Canada Way, Burnaby 2.

DESCRIPTION: A few outcrops of andesite and diorite are found in an area largely covered by overburden.

WORK DONE: 1971 – reconnaissance geochemical survey; 1972 – surface geological mapping, 1 inch equals 400 feet covering Queen 150, 159-168, 183, and 185; magnetometer survey, 80 line-miles covering Queen 1-200; electromagnetic survey, 80 line-miles covering Queen 1-200; induced polarization and resistivity survey, 9.4 line-miles covering Queen 112-124, 134-139, 144, 147, 149-151, 156-166, 175-178, 180-182, 191, 193-196; geochemical soil survey, 324 samples covering Queen 6, 7, 21, 23-25, 42, 63-67, 122-124, 134-139, 144, 147, 149-151, 156-166, 175-178, 180-182, 191, 193-196; road construction, 6 miles (from Cassiar-Stewart Highway 12 miles south of Dease Lake, connects with 7 miles of tote road); surface diamond drilling, one hole totalling 117 feet on Queen 166.

REFERENCE: Assessment Report 3736.

LOTUS (No. 10, Fig. G)

LOCATION: Lat. 58° 18'-19' Long. 129° 40'-44' (104I/5E)
LIARD M.D. Three miles east of the Tanzilla River and 8 miles southeast of Tanzilla Butte, 20 miles southeast of Dease Lake.

CLAIMS: LOTUS 1 to 40.

ACCESS: By aircraft from Dease Lake, 20 miles.

OWNER: NITTETSU MINING CO., LTD., 404, 470 Granville Street, Vancouver 2.

WORK DONE: Reconnaissance geochemical survey, 816 samples during 1971.

REFERENCE: Assessment Report 3538.

OWL (No. 41, Fig. G)

LOCATION: Lat. 58° 19.5'-21' Long. 129° 36'-44' (104I/5E)
LIARD M.D. At approximately 4,300 feet elevation 4 miles east of the Tanzilla River and 7 miles southeast of Tanzilla Butte, 20 miles southeast of Dease Lake.

CLAIMS: OWL 1 to 97.

ACCESS: By helicopter from Dease Lake, 12 to 15 miles.

OWNER: UNION MINIERE EXPLORATIONS AND MINING CORPORATION LIMITED, 200, 4299 Canada Way, Burnaby 2.

METAL: Molybdenum.

DESCRIPTION: The eastern half of the property is underlain by intrusive rocks comprised principally of quartz diorite and granodiorite. The western half is underlain by Triassic volcanic rocks, principally andesitic flows, flow breccias, and some tuffs. To the north these volcanic rocks are overlain by Lower Jurassic sedimentary rocks, principally argillites.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet; electromagnetic survey, 1.5 line-miles and ground magnetometer survey, 5.9 line-miles covering Owl 61-66, 81, 83, and 85; geochemical soil survey, 297 samples covering same claims; surface diamond drilling, one hole totalling 205 feet on Owl 64.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 45.

ASB (No. 63, Fig. G)

LOCATION: Lat. 58° 29' Long. 129° 15' (104I/6)
LIARD M.D. At elevations of 4,000 to 5,000 feet east of Serpentine Lakes and south of Eaglehead Lake, 30 miles east of Dease Lake.

CLAIMS: ASB 1 to 8, DHA 1 to 12, BYN 1 to 20.

ACCESS: By aircraft from Dease Lake.

OWNER: HENRY NEUGEBAUER, 3864 West Eighth Avenue, Vancouver 8.

METALS: Copper, asbestos.

DESCRIPTION: Chrysotile occurs in veinlets up to 1 inch in width in peridotite. Fine-grained disseminated chalcopyrite and pyrite also occur in the peridotite.

WORK DONE: Magnetometer survey covering ASB 3-8.

REFERENCE: Assessment Report 3992.

JJR (No. 12, Fig. G)

LOCATION: Lat. 58° 21' Long. 129° 05' (104I/6E)
LIARD M.D. Four miles northeast of Turnagain Lake, 36 miles east-southeast of Dease Lake.

CLAIMS: JJR 1 to 152.

ACCESS: By helicopter from Dease Lake, 36 miles.

OWNER: JOREX LIMITED, 85 Richmond Street West, Toronto 1, Ont.

METAL: Chromium.

DESCRIPTION: Mineralization occurs in serpentinized peridotite of Lower Mississippian or Upper Devonian age.

WORK DONE: Geological mapping and geochemical survey, 213 samples, during 1971.

REFERENCE: Assessment Report 3530.

EAGLE (No. 45, Fig. G)

By A. Panteleyev

LOCATION: Lat. 58° 28'-31.5' Long. 129° 04'-12.5' (104I/6E, 11E)
LIARD M.D. At approximately 5,000 feet elevation 4 miles southeast of Eaglehead Lake, 32 miles east of Dease Lake.

CLAIMS: EAGLE 1 to 79, 81, 83, 85, 87, 90 to 140.

ACCESS: By helicopter from Dease Lake, 28 miles.

OWNER: Spartan Explorations Ltd.

OPERATOR: IMPERIAL OIL LIMITED, 500 Sixth Avenue SW., Calgary, Alta.

(104I/6E, 11E)

METALS: Copper, molybdenum.

DESCRIPTION:

The Eagle claims straddle a northwesterly flowing creek that marks the approximate contact between a Jurassic granitic intrusion forming part of the Cassiar batholith and Lower Jurassic sedimentary rocks. Some pyrite and indications of copper mineralization are found over a distance of about 4,500 feet in nearly all rock exposures in the main creek and its eastern tributaries. There is little bedrock exposed on the gently sloping valley walls that border the claim block. The ridge crest to the north and east is covered with granitic frost-shattered debris and felsenmeer while barren sedimentary rocks outcrop to the south and west. The valley floor is mantled by till and fluvioglacial deposits.

The showings were found and located in 1963 as the Joy group. Prospecting and geologic mapping limited the area of interest and geochemical sampling of silt from most drainage channels and seepage areas outlined an elongate copper-molybdenum anomaly trending along the inferred geologic contact within the area of granitic rocks. The following year an induced polarization survey defined a large anomaly within the geochemically anomalous area. In 1965 four drill holes tested two zones with the strongest coincident geochemical and geophysical responses and short mineralized intercepts grading from 0.4 to 0.6 per cent copper were found in two of the holes. The area was relocated in 1970 and more systematic geochemical sampling together with induced polarization and magnetic surveys defined the anomaly more closely. In 1972 six drill holes tested the anomalous area in the same general locations as the earlier drilling with much the same results.

Geology of the property is relatively simple with the northern and eastern claims underlain by granitic rocks and the southern and western claims underlain by sedimentary and metasedimentary rocks. Intruded rocks are well-bedded greywacke, conglomerate, and siltstone derived from predominantly porphyritic andesitic to basaltic volcanic rocks. One thinly bedded limestone unit is interbedded with the clastic rocks and can be followed along a considerable strike length. The beds are steeply dipping and folded about northwesterly axes. There is some evidence for overturned strata and the folds may be inclined and locally recumbent.

Rocks within the main body of the intrusion are superficially homogeneous medium to coarse-grained granodiorite while near the contact the rocks are somewhat porphyritic. Porphyritic rocks contain 15 to 20 per cent quartz, 60 to 75 per cent plagioclase, and less than 15 per cent K-feldspar and may be therefore classed as granodiorite or quartz diorite (tonalite). The leucocratic character of the rock as a result of only 5 to 10 per cent biotite content and the sodic nature of the plagioclase ($\text{An}_{27/33}$) may permit use of the name trondhjemite.

Secondary foliation is evident in many outcrops along the creek beds and appears to be restricted to a zone within a few hundred feet of the contact. Sedimentary rocks are only weakly foliated and display a phyllitic parting that roughly parallels the bedding and the trend of the intrusive contact. Foliation in the granitic rocks shows considerable variation in intensity and widths across which it is developed. Schistose zones are commonly 1 to 5 feet wide but may be tens of feet in width and are interspersed between bands of less intensely foliated rock and screens of weakly fractured or jointed rock.

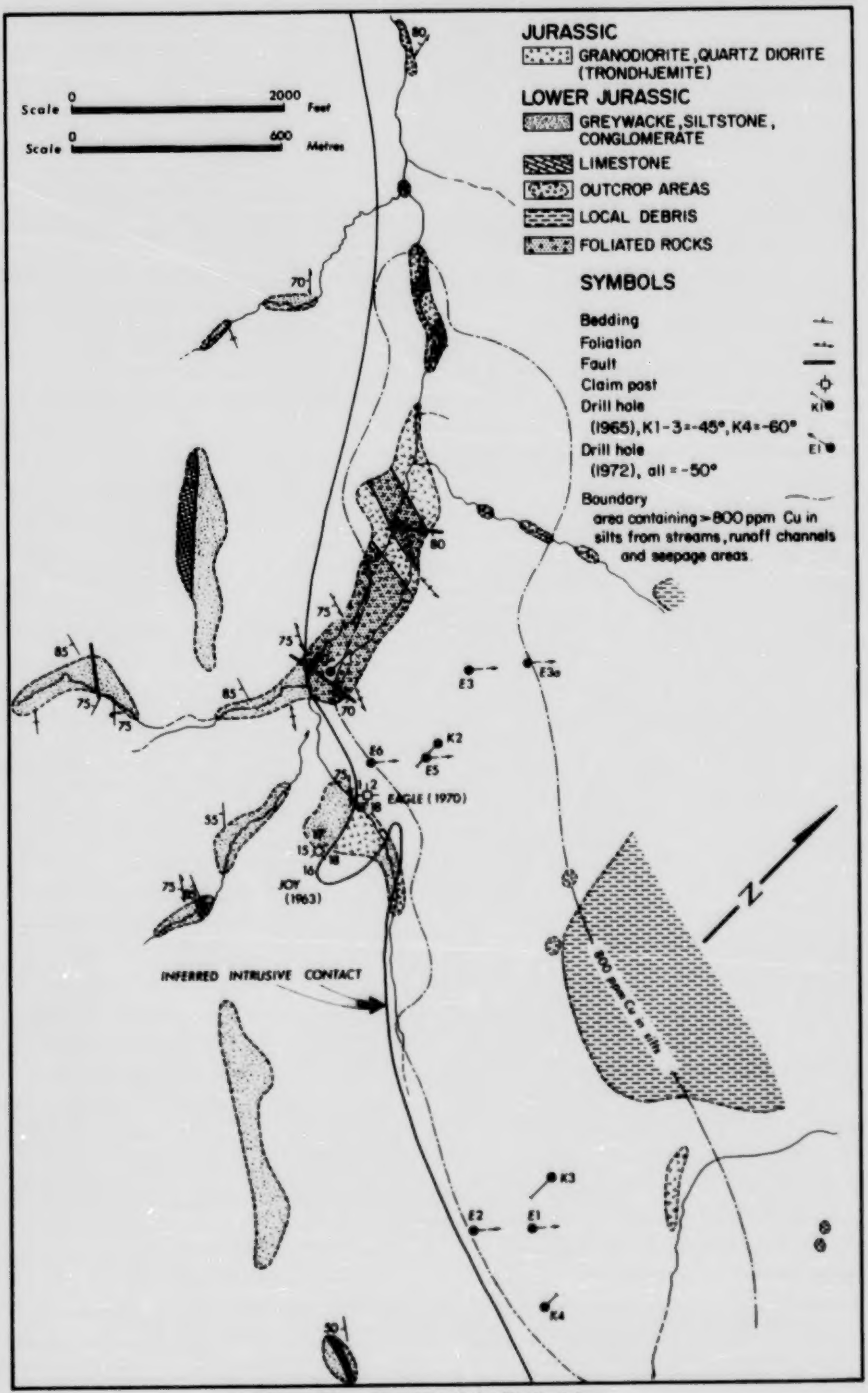

JURASSIC
GRANODIORITE, QUARTZ DIORITE (TRONDHJEMITE)
LOWER JURASSIC
GREYWACKE, SILTSTONE, CONGLOMERATE
LIMESTONE
OUTCROP AREAS
LOCAL DEBRIS
FOLIATED ROCKS
SYMBOLS
Bedding
Foliation
Fault
Claim post
Drill hole (1965), K1-3=-45°, K4=-60°
K1
Drill hole (1972), all = -50°
E1
Boundary area containing >800 ppm Cu in silts from streams, runoff channels and seepage areas
Scale 0 2000 Feet
Scale 0 600 Metres
80
70
75
85
55
50
E3
E3a
E6
K2
E5
EAGLE (1970)
JOY (1963)
15
16
18
INFERRED INTRUSIVE CONTACT
800 ppm Cu in silts
N
K3
E2
E1
K4

Figure 67. Geology of the Eagle claims.

In thin sections cataclastic textures are obvious. Crush breccias with bent and fractured plagioclase laths and strained quartz grains are widespread. Weakly foliated rocks show protomylonite textures in which intergranular movement has caused the formation of quartz and feldspar porphyroclasts in a crushed matrix. Schistose rocks are true mylonites in which fluxion structures with rotated quartz and plagioclase grains in a recrystallized sericite - chlorite - (albite ?) matrix are visible. The development of foliated rocks in restricted belts and the variable intensity of foliation suggests that cataclasis resulted from compressive forces and stresses localized along the margin of the intrusion and foliation is not due to regional metamorphism which would have imparted more widespread and evenly developed penetrative deformation.

Alteration affects are generally weak. The most widespread alteration is caused by retrogressive metamorphism in cataclastic zones (diaphthoresis) to form a propylitic or greenschist facies assemblage consisting of quartz, chlorite, sericite, albitized plagioclase, and lesser carbonate, epidote, and hematite. Elsewhere the less sheared rocks are bleached to a cream or buff colour. In these leucocratic zones the least altered rocks have fine-grained sericite clouding the feldspars and contain scattered grains of chlorite, epidote, and rhombs of ankeritic carbonate. The more strongly altered zones are phyllic assemblages of coarse-grained sericite (determined by X-ray to be muscovite), quartz, and ankeritic carbonate as veins and fracture fillings. Quartz veins are generally small, widely spaced, and often are barren, milky white quartz.

Mineralization has very little surface expression as outcrops are generally relatively fresh and unaltered. Careful examination, however, reveals the presence of widespread malachite and traces of chalcopyrite and pyrite can be found in almost any outcrop. Pyrite content in places approaches 3 to 4 per cent but there is generally 1 per cent or less. Chalcopyrite is seen as rare disseminated grains but also occurs in coarse patches in gash veins, stringers, and irregular fractures. In drill holes the best copper grades appear to be associated with such patchy, coarse replacements. It is significant that in many of the mineralized fractures chalcopyrite is accompanied by K-feldspar flooding in otherwise propylitic rocks. It is common to see pyrite or hematite sheared along slip faces and some chalcopyrite-bearing fractures transect foliation. Molybdenite was noted in only a few quartz veinlets and a single occurrence of bornite is known. Small amounts of chalcocite as rims on chalcopyrite, chrysocolla, and tetrahedrite were also noted in separate localities.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 400 feet covering Eagle 1-8, 17, 18, 35-38, 53-66, 92-104; induced polarization survey, 12 line-miles covering same claims; surface diamond drilling, six holes totalling 3,850 feet on Eagle 2, 36, 98, and 102.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, pp. 45, 46; Assessment Report 3476.

TOM, T (No. 14, Fig. G)

LOCATION: Lat. 58° 23' Long. 128° 50' (104I/7W)
LIARD M.D. Between Ferry and Flat Creeks 4.5 miles southeast of Turnagain River, 50 miles east of Dease Lake.

(104I/7W)

CLAIMS: TOM 1 to 4, T 1 to 6.

ACCESS: By aircraft from Dease Lake.

OWNER: WINCO MINING & EXPLORATION LTD., 1334 West Pender Street, Vancouver 5.

WORK DONE: Airborne magnetometer, electromagnetic, and radioactivity survey.

REFERENCE: Assessment Report 3738.

TURN (No. 15, Fig. G)

LOCATION: Lat. 58° 27'-29' Long. 128° 47'-55' (104I/7W)
LIARD M.D. Between elevations of 3,500 and 6,000 feet on Turnagain River, 2 miles northeast of Hard Creek.

CLAIMS: TURN 1 to 122, COBALT, PYRRHOTITE.

ACCESS: By aircraft from Dease Lake, 40 miles to the west.

OWNERS: Hard Creek Mines Limited (Turn 1-122 and Pyrrhotite) and Falconbridge Nickel Mines Limited (Cobalt).

OPERATOR: WESFROB MINES LIMITED, 500, 1112 West Pender Street, Vancouver 1.

METALS: Nickel, copper.

DESCRIPTION: Chalcopyrite and pentlandite occur with pyrrhotite in a pyroxenite-peridotite body.

WORK DONE: Geological mapping, 1 inch equals 200 feet on the southern claims during 1971 and 1972.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 46.

WOLF (No. 35, Fig. G)

LOCATION: Lat. 58° 37.5' Long. 128° 13' (104I/9E)
LIARD M.D. At approximately 3,500 feet elevation about 5 miles west of the confluence of the Cassiar and Turnagain Rivers.

CLAIMS: WOLF 1 to 8.

ACCESS: By helicopter from Watson Lake, Yukon Territory, approximately 100 miles.

OWNER: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.

METAL: Tungsten.

DESCRIPTION: Scheelite appears to be associated with quartz veining and silificiation of schists and quartzites near quartz vein contacts.

WORK DONE: Trenching, 110 feet on Wolf 3 and 5.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1970, p. 41.

HERB (No. 36, Fig. G)

LOCATION: Lat. 58° 41' Long. 128° 10' (104I/9E)
LIARD M.D. At approximately 5,300 feet elevation 5 miles northwest of the confluence of the Turnagain and Cassiar Rivers.

(104I/12W)

CLAIMS: HERB 1 to 30, HERB 1 Fraction.

ACCESS: By helicopter from Watson Lake, Yukon Territory, approximately 100 miles.

OWNER: EL PASO MINING AND MILLING COMPANY, 500, 885 Dunsmuir Street, Vancouver 1.

METALS: Lead, zinc, silver.

DESCRIPTION: Galena and sphalerite occur as veins in highly kaolinized granite. Limonite and manganese staining is widespread.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 100 feet covering Herb 1-20; electromagnetic survey, 29 line-miles covering Herb 1-20; geochemical soil survey, 1,600 samples covering Herb 1-20; road construction, 3 miles (from Turnagain River to property); trenching, 4,700 feet on Herb 7-10; surface diamond drilling, 12 holes totalling 6,411 feet on Herb 7-10.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 40.

COP (No. 52, Fig. G)

LOCATION: Lat. 58° 38.8'-40.9' Long. 129° 46.4'-49.2' (104I/12W)
LIARD M.D. At approximately 4,500 feet elevation 1 mile west of Eagle River, 8 miles east of Dease Lake.

CLAIMS: COP 1 to 36.

ACCESS: By helicopter from Dease Lake, 8 miles.

OWNER: UNION MINIERE MINING AND EXPLORATION CORPORATION LIMITED, 200, 4299 Canada Way, Burnaby 2.

DESCRIPTION: The property lies within the Atlin horst and is underlain by Upper Devonian and Lower Mississippian shales and greenstone of uncertain age.

WORK DONE: Surface geological mapping, 1 inch equals 800 feet covering all claims; magnetometer survey, 20 line-miles covering all claims; induced polarization and resistivity survey, 2.4 line-miles covering Cop 19, 21, 23-29; geochemical soil survey, 504 samples covering all claims.

REFERENCE: Assessment Report 4093.

NIZ (No. 49, Fig. G)

LOCATION: Lat. 59° 58'-59.4' Long. 128° 57.5' - 129° 00.5' (104I/14E, 15W)
LIARD M.D. Between 4,500 and 6,500 feet elevation 1 mile east of Nizi Creek, 7 miles northeast of Beale Lake and about 20 miles south-southeast of McDame settlement.

CLAIMS: NIZ 1 to 40.

ACCESS: By winter road and/or trail from McDame, 20 miles or by helicopter from Cassiar, 45 miles.

OWNER: J.J.A. Altenburg.

OPERATOR: SUMAC MINES LIMITED, 10th Floor, 510 West Hastings Street, Vancouver 2.

METALS: Lead, zinc.

DESCRIPTION: Veins and fracture fillings containing sphalerite and minor galena and stibnite occur in siliceous metasedimentary rocks. Erratic copper mineralization is associated with minor intrusions.

WORK DONE: Surface geological mapping and geochemical soil and silt survey, approximately 1,000 samples covering all claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 47; Assessment Reports 2789, 3404 (line-cutting), 4096.

JOHNNY (No. 11, Fig. G)

LOCATION: Lat. 58° 46.5' Long. 128° 18.0' (104I/16W)
LIARD M.D. At 3,700 feet elevation on the northeast end of Blue Sheep Lake at the headwaters of the main south tributary of Major Hart Creek.

CLAIMS: JOHNNY 1 to 24.

ACCESS: By floatplane from Dease Lake, 67 miles.

OWNER: Charles J. Shandalla.

OPERATOR: CALTOR SYNDICATE, 1011, 2200 Yonge Street, Toronto, Ont.

METALS: Silver, lead, zinc, iron.

DESCRIPTION: Mineralization occurs in float at a porphyry-limestone contact.

WORK DONE: Geological mapping, 1 inch equals 200 feet, magnetometer survey, and electromagnetic survey during 1971.

REFERENCE: Assessment Report 3539.

DEASE LAKE 104J

CROWN (No. 42, Fig. G)

LOCATION: Lat. 58° 12.4'-14.8' Long. 129° 59' - 130° 00.5' (104I/4W; 104J/1E)
Report on this property in section 104I/4W.

VI (No. 70, Fig. G)

LOCATION: Lat. 58° 04'-07' Long. 131° 38'-41' (104J/4E)
LIARD M.D. At approximately 4,000 feet elevation on the upper stream of Hackett River, 6 miles southwest of Kennicott Lake.

CLAIMS: VI 1 to 17, 19, 21, 23 to 27, 29 to 32, 35, 49.

ACCESS: By helicopter from Telegraph Creek, 25 miles.

OWNER: SUMITOMO METAL MINING CANADA LTD., 1022, 510 West Hastings Street, Vancouver 2.

METAL: Copper.

DESCRIPTION: The property is underlain by Upper Triassic volcanic rocks intruded by small intrusive bodies containing disseminated pyrite and chalcopyrite.

WORK DONE: Geochemical soil survey, 331 samples covering 22 claims.

REFERENCE: Assessment Report 3972.

KID, GRIZZLY (No. 33, Fig. G)

LOCATION: Lat. 58° 14.7′ Long. 131° 52.8′ (104J/4W)
ATLIN M.D. At approximately 3,800 feet elevation on the west side of the Sheslay River, 2.5 miles above junction with the Hackett River.

CLAIMS: KID, GRIZZLY, RED, totalling 53.

ACCESS: By helicopter from the Sheslay airstrip, 3.5 miles or from Telegraph Creek, 35 miles.

OPERATOR: COBRE EXPLORATION LIMITED, 1400, 1030 West Georgia Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: Chalcopyrite is disseminated in syenitic to monzonitic intrusions and in shear zones in adjacent volcanic rocks.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet covering Kid 1, Grizzly 3-10, and Red 41, 42; magnetometer survey, 7.7 line-miles covering Kid 1, Grizzly 5-10, 15, 17, 19, and Red 41, 42; geochemical soil survey, 104 samples covering Grizzly 5, 9, 10 and Red 41, 42, 105.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 31; Assessment Reports 3990, 3991.

GO, G (No. 50, Fig. G)

By A. Panteleyev and B. M. Dudas

LOCATION: Lat. 58° 12′-16′ Long. 131° 44′-53′ (104J/4, 5)
ATLIN M.D. On Kaketsa Mountain and along Hackett River, 20 miles northwest of Telegraph Creek, at an elevation of 4,300 feet.

CLAIMS: GO, G, CU, CAR, BONE, OH, PAT, HO, JOY, totalling approximately 475.

ACCESS: By fixed-wing aircraft from Dease Lake, 66 miles.

OWNERS: Skyline Explorations Ltd. and Global Natural Resources Corporation Limited.

OPERATOR: NEWCONEX CANADIAN EXPLORATION LTD., 808, 525 Seymour Street, Vancouver 2.

METAL: Copper.

DESCRIPTION:

A number of copper occurrences are known near the contact of the Kaketsa stock with Upper Triassic volcanic and related sedimentary rocks. The main area of interest is within a 6,000 by 2,500-foot zone of weakly pyritic rocks along the eastern margin of the stock. Here copper mineralization is localized along northwesterly trending fractures in a large embayment in the stock. Pyrite and traces of disseminated chalcopyrite are also found in many of the dykes and irregular intrusive bodies to the east and southeast of the main contact.

The volcanic rocks are mainly porphyritic flows with lesser tuffs and tuffaceous siltstones. The flow rocks form massive units without any discernible stratification. They are grey to dark green andesitic to basaltic porphyries with euhedral, prismatic phenocyrsts of amphibole and uralitic hornblende up to 1 centimetre diameter in a fine-grained matrix of basic andesine and amphibole. Tuffaceous rocks occur in a single unit about 200 feet thick and outcrop in the northwest corner of the survey grid as a persistent north-northeast to northeast-striking band with 60 to 75-degree dips to the west. Fossils collected by the Geological Survey of Canada (Map 21-1962) show the rocks to be Karnian (early Upper Triassic) and thus correlative with the Stuhini Group.

The Kaketsa stock is an elliptical intrusion some 2.5 by 3.5 miles in diameter. It is only slightly younger than the volcanic pile it intrudes. Hornblende collected by the writer one-half mile to the west of the main showings gave a K-Ar date of 218±8 million years – Middle to Upper Triassic (analysis at the University of British Columbia). The intrusion has been forcefully emplaced as it is foliated and contains many xenoliths near its border ranging in size from pebbles to large blocks. The intruded rocks have concordant foliation up to 200 feet from the contact and are strongly foliated for tens of feet from the stock.

The stock and related dykes in the area of interest are mainly medium-grained hornblende diorite with a foliated appearance caused by preferred orientation of hornblende laths. Hornblende and minor augite constitute about 25 per cent of the rock and the remainder is about 60 per cent zoned plagioclase (An$_{40-50}$), 6 to 8 per cent quartz, 8 to 12 per cent K-feldspar and lesser magnetite, epidote, chlorite, apatite, and sphene. Portions of the contact zone and some dykes are mafic-rich gabbroic rocks that contain pyroxene as well as hornblende and have zoned plagioclase with cores of labradorite (An$_{55}$) and rims of andesine (An$_{45}$). Inward from the contact the Kaketsa stock is less foliated, coarser grained, and contains bitoite and hornblende. The core of the stock is medium to coarse-grained, equigranular quartz diorite or granodiorite. A younger stock intrudes the northeast contact of the Kaketsa stock. Its border phase is a fine-grained quartz-bearing diorite containing biotite, hornblende, andesine (An$_{35-40}$), and some fine-grained interstitial quartz.

Minor intrusions related to the Kaketsa stock intrude volcanic rocks to the east and southeast of the main stock. They form dykes and irregular masses separated by screens and small roof pendants of volcanic rocks. The intrusions appear to be apophyses of the main stock or parts of a partially exhumed, irregular cupola that may be underlain by a gently sloping flank of the main stock.

Two other groups of dykes were recognized: an early suite related to the volcanic rocks and a later suite of monzonite and syenite intrusions that may be late differentiates of the main diorite magma. The early dykes are diorite to diabase in composition and intrude randomly as thin bodies with no preferred trends. Except for a more uniform, diabasic, fine-granular matrix they are virtually indistinguishable in outcrop from the porphyritic amphibole-bearing volcanic rocks that they intrude. A less common variety of the early dykes is a coarse andesite or basalt feldspar porphyry with prominent light weathering phenocrysts of plagioclase up to 1 centimetre in size in a fine-grained matrix.

The younger dyke suite consists of diorite to quartz diorite and leucocratic grey and pink porphyritic dykes of monzonite and syenite. They are found throughout the area examined but are most abundant east of 'Polar' Creek. Syenite dykes along Polar Creek and to the east are a few feet to tens of feet wide but nearer the contact of the stock

K-feldspar-bearing dykes are generally thin. Near the contact they range in composition from syenite to aplite and form vein-like structures of coarse K-feldspar with minor quartz and epidote. These aplite and K-feldspar-bearing dykelets, together with injections, veins, and fracture replacements may be regarded as a type of alteration. Most commonly the alteration is seen as thin, widely spaced K-feldspar-flooded fractures that also contain epidote and minor quartz, siderite, calcite, and sulphides. Otherwise alteration is generally weak and is indicated by a greenish colouration in the volcanic rocks caused by dispersed epidote, chlorite, actinolite, and magnetite that occurs mostly along fractures. Fault and fracture zones that commonly contain thin bands of mylonite also contain stringers of quartz, sulphides, magnetite, hematite, siderite, and calcite. A late-forming alteration consists of a soft buff to pink, fibrous mineral that coats fracture surfaces in sheared rocks and was identified as the zeolite laumontite.

Sulphide mineralization is widespread as fracture-controlled pyrite in volcanic rocks and disseminated pyrite in diorite dykes. Chalcopyrite occurs in trace amounts with pyrite but higher copper grades are localized in steep, predominately northwesterly striking fracture zones. In the area of the main showings a series of subparallel or interconnected fracture and shear zones and thin bands of mylonite have localized mineralization in a 200 by 300-foot area. Chalcopyrite is seen as fracture fillings and fine-grained replacements in the fractured volcanic rocks and margins of dykes within the zone. Chalcopyrite is frequently accompanied by patches, fracture fillings, and stringers of specular hematite and magnetite. Along strike from the main zone to the northwest and in a number of other localities, mineralization is more vein-like in character with siliceous zones in the highly fractured rocks containing impregnations of fine-grained magnetite and patches or grains of chalcopyrite, pyrite, sphalerite, hematite, marmatitic magnetite, siderite, and possibly marcasite.

A composite sample from the hand trenches in the main zone is reported by the owners to have returned a weighted copper assay of 0.48 per cent copper over 425 feet. During this examination a considerable amount of goethite, brochantite, chalcocite, possibly covellite, and films of undetermined black oxides were noted in the trenches. Three samples of typical mineralization from the centre of the main zone totalling 45 feet returned a mean value of 0.58 per cent total copper of which 0.34 per cent was oxide copper and 0.24 per cent was sulphide copper. The amount of copper enrichment due to deposition of secondary copper minerals is uncertain but may be equivalent to the amount leached. The validity of surface assays will have to be tested by diamond drilling.

WORK DONE: Topography and surface workings mapped; surface geological mapping, 1 inch equals 200 feet covering Go 87-90 and Car 10-14; road construction, 8 miles; trenching, approximately 6,000 feet on Go 87-90, Car 9-15, and Cu 13 and 15; surface diamond drilling, seven holes totalling 2,708 feet on Go 85, 86, 87, 88, and 90.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 48, 49; Assessment Reports 3514, 3515, 3516.

PET (No. 43, Fig. G) By A. Panteleyev

LOCATION: Lat. 58° 23' Long. 131° 47' (104J/5W)

ATLIN M.D. At approximately 3,700 feet elevation on Dudidontu River, between Ketchum and Camp Island Lakes, 65 miles west of

(104J/5W)

Dease Lake.

CLAIMS: PET 1 to 94.

ACCESS: By helicopter from Dease Lake, 65 miles or from Sheslay airstrip, 10 miles to the south.

OWNER: Texasgulf Inc.

OPERATOR: ECSTALL MINING LIMITED, 701, 1281 West Georgia Street, Vancouver 5.

METAL: Copper.

DESCRIPTION:

Chalcopyrite-hematite mineralization is found in a 300 by 800-foot area and in a number of other occurrences adjacent to the Old Telegraph trail. The area is underlain by volcanic rocks of Upper Triassic age and part of a large Triassic or younger stock ranging in composition from granodiorite to syenite. These Mesozoic rocks are overlain by extensive Tertiary volcanic flows equivalent to the Heart Peak and Level Mountain volcanic rocks. Northeasterly and north to northwesterly trending fault systems are the dominant structural feature.

The main mineralized area is contained within granitic rocks that have been variously described as syenite, hybrid syenite, and granodiorite. Thin sections and K-feldspar-stained specimens show the rock to contain from 8.8 to 11.4 per cent quartz with an average of 10.4 per cent, mainly as small interstitial granules. K-feldspars constitute from 34 to 64 per cent of total feldspars. The rock may, thus, be classified as a leucocratic, medium-grained, hypidiomorphic-granular, biotite quartz monzonite or quartz-bearing monzonite.

The intrusive rocks are extensively fractured. Deformation is even evident in the least altered specimens which in thin section show well-developed parting and undulatory extinction in quartz grains. More intense deformation has caused intergranular movement and the development of weak foliation, which is seen in many of the outcrops. Locally, strongly foliated rocks have developed along north-south trends and commonly contain narrow brecciated zones in which mineralization normally occurs. Alteration is indicated by a colour change in outcrops and hand specimens.

The most widespread alteration is a pervasive, pink colouration that may be caused in part by K-feldspar but is probably largely due to the presence of finely dispersed hematite. However, the most profound alteration is replacement and associated fracture filling by ankerite which may form 10 per cent or more of the rocks. Sheared rocks usually appear bleached due to an increase in sericite and clay minerals and an attendant destruction of biotite.

A distinctive gossan has formed over parts of the mineralized zone characterized by 'limonite' that is a dark yellowish brown powder. This was determined by X-ray to be an amorphous substance derived mainly from the alteration of ankerite.

Mineralization occurs most notably in discontinuous, braided, breccia zones a few inches to a few feet in width. The strongest mineralization consists of coarse-grained specular hematite containing random sulphide grains or, less commonly, patches of sulphide grains with little or no hematite. The most widespread mineralization is scattered grains or stringers of specular hematite and/or sulphides on fracture and shear planes or occasionally with calcite or quartz veinlets.

Detailed examination reveals that in addition to the main sulphides chalcopyrite and pyrite, small amounts of bornite, chalcocite, and minor sphalerite, tennantite, and traces of an unidentified sulphosalt are present. The chalcocite has metallic lustre and appears to be primary. It occurs as grain boundary and crystallographically controlled replacements of bornite and chalcopyrite and as rare, discrete grains on fractures. Supergene affects are minimal and are restricted to the development of some malachite, thin goethite rims on sulphide grains and fractures, and formation of minute covellite 'flames' on bornite and chalcopyrite.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 500 feet covering all claims; induced polarization (orientation only), approximately 2 line-miles; magnetometer survey, approximately 25 line-miles covering central claims; trenching, 630 feet on Pet 17, 19, 29, 31, 32, 35, 37-40, 45, 51, 53, 79 Fraction, 92-94 Fractions.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 49; Assessment Reports 3695, 4095.

MACK (No. 27, Fig. G)

LOCATION: Lat. 58° 27.2′ Long. 130° 26.4′ (104J/8W)
LIARD M.D. Between 4,800 and 5,950 feet elevation on Snow Peak, 16 miles west of the south end of Dease Lake.

CLAIMS: MACK, CUBES, FUZZ, FERN, DAVE, BOB, totalling 107.

ACCESS: By helicopter from Dease Lake, 16 miles.

OWNER: TORMEX RESOURCES LTD. (subsidiary of Tournigan Mining Explorations Ltd.), 704, 535 Thurlow Street, Vancouver 5.

METALS: Molybdenum, copper, tungsten.

DESCRIPTION: Molybdenum, copper, and scheelite mineralization occurs over an area approximately 3,200 feet by 3,000 feet in a quartz monzonite stock intruding mostly Lower Jurassic metasedimentary rocks.

WORK DONE: Claims and topography mapped; surface geological mapping, 1 inch equals 400 feet; magnetometer survey, 28 line-miles; geochemical soil survey, 19 line-miles covering all claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 49; Assessment Report 3848.

QUEEN (No. 26, Fig. G)

LOCATION: Lat. 58° 16.8′-21′ - Long. 129° 59′ - 130° 12′ (104I/5W, 104J/8E)
Report on this property in section 104I/5W.

HU (No. 16, Fig. G)

LOCATION: Lat. 58° 20.5′-21.5′ - Long. 130° 10′-16′ (104J/8E)
LIARD M.D. At approximately 4,500 feet elevation on the south side of Tanzilla River, 9 miles southwest of the south end of Dease Lake.

(104J/16W)

CLAIMS: HU 1 to 50.

ACCESS: By helicopter from Dease Lake, 9 miles.

OWNER: TOURNIGAN MINING EXPLORATIONS LTD., 704, 535 Thurlow Street, Vancouver 5.

METAL: Copper.

DESCRIPTION: Chalcopyrite, pyrite, and minor molybdenite are associated with syenite and andesite intrusions into volcanic rocks.

WORK DONE: Induced polarization survey, 16.6 line-miles covering the east end of the group; geochemical soil survey covering the southeast part.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 37; Assessment Report 3737.

JIM (No. 2, Fig. G)

LOCATION: Lat. 58° 54'-56.7' Long. 130° 15'-21' (104J/16W)
LIARD M.D. At the junction of Beaver and Canyon Creeks, 2 miles northwest of Slough Mountain and 12 miles northwest of Dease Lake.

CLAIMS: JIM, DEAK, BILL, GLEN, totalling 115.

ACCESS: By helicopter from the north end of Dease Lake, 12 miles.

OWNER: CASSIAR ASBESTOS CORPORATION LIMITED, 10th Floor, 85 Richmond Street W., Toronto, Ont.

METALS: Molybdenum, copper.

DESCRIPTION: Chalcopyrite and molybdenite occur along fracture planes and disseminated in granite and quartz monzonite.

WORK DONE: Geochemical survey during 1971.

REFERENCE: Assessment Report 3424.

SHIELD (No. 44, Fig. G)

LOCATION: Lat. 59° 53'-55' Long. 130° 15'-17' (104J/16W)
LIARD M.D. At approximately 4,000 feet elevation one-half mile east of Beaver Creek and one-quarter mile east of Slough Mountain, 8 miles northwest of the north end of Dease Lake.

CLAIMS: SHIELD 1 to 206.

ACCESS: By helicopter from Dease Lake, 35 miles.

OWNER: UNION MINIERE EXPLORATIONS AND MINING CORPORATION LIMITED, 200, 4299 Canada Way, Burnaby 2.

METALS: Molybdenum, copper.

DESCRIPTION: Quartz monzonite and quartz monzonite porphyry of the Cassiar batholith are cut by a large northwesterly trending fault zone. The adjoining rocks have pervasive propylitic alteration and some quartz veining. Molybdenite occurs in fractures in a restricted zone with potassic alteration and quartz veining.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet; ground magnetometer survey, 32.4 line-miles; electromagnetic survey, 4 line-miles; geochemical soil survey, 796 samples; surface diamond drilling, six holes totalling 1,543.5 feet on Shield 4, 18, 20, and 37.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 50.

TULSEQUAH 104K

KAREN (No. 3, Fig. G)

By B. M. Dudas

LOCATION: Lat. 58° 18.8' Long. 132° 38' (104K/7E)
ATLIN M.D. About 60 miles northwest of Telegraph Creek, approximately 10 miles south of Trapper Lake.

CLAIMS: TRAPPER 1 to 18, 20 to 24, MO 1 to 10, and 20 KAREN.

ACCESS: By helicopter from Atlin, 90 miles.

OPERATOR: WHARF RESOURCES LTD. (formerly Plateau Metals & Industries Ltd.), 101, 535 Thurlow Street, Vancouver 5.

METALS: Molybdenum, copper.

DESCRIPTION: The main rock types are granodiorite and monzonite. The granodiorite is intruded by small stocks of alaskite. The main mineralization is molybdenite with minor chalcopyrite. The mineralization is associated with alaskite.

WORK DONE: The property was discovered and staked by Mr. Godfrey, a prospector for Southwest Potash Corporation in 1962 but no work was done and the claims were allowed to lapse. In 1970 the property was restaked and acquired by Mr. E. Mueller. A photogeological survey was carried out by Stikine Copper Ltd. on the Karen claims in 1971. Presently the property is owned by Hesca Resources Corporation Ltd. and was optioned to Wharf Resources Ltd. During 1972 Wharf Resources Ltd. drilled three diamond-drill holes, totalling 1,041 feet on Karen 40A, 77A, and 89A. A geological survey was also carried out. At year end Wharf Resources relinquished their option.

REFERENCE: Assessment Report 3421.

NORM (No. 29, Fig. G)

LOCATION: Lat. 58° 17.3' Long. 132° 02.5' (104K/8E)
ATLIN M.D. At an elevation of 4,500 feet 4 miles east of the Samotua River, 42 miles northwest of Telegraph Creek.

CLAIMS: NORM 1 to 4, 9 to 16, 18, 20 to 34.

ACCESS: By helicopter from Telegraph Creek or from the Sheslay airstrip, 10 miles.

OWNER: SKYLINE EXPLORATIONS LTD., 1212, 1177 West Hastings Street, Vancouver 1.

METALS: Copper, molybdenum, iron.

DESCRIPTION: Small quartz stockworks with molybdenite are developed along the southern margin of a small porphyritic quartz monzonite stock that intrudes pre-Upper Triassic sedimentary and volcanic rocks. A small zone of magnetite-rich skarn occurs along the northern contact of the intrusion.

WORK DONE: Geological and geochemical surveys.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1963, p. 7 (Fae); *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 50; Souther, J. G., *Geol. Surv., Canada,* Mem. 362, 1971, p. 56; Assessment Reports 476, 3297, 3842.

TITO (No. 66, Fig. G)

LOCATION: Lat. 58° 21.5' Long. 132° 00.5' (104K/8E)
ATLIN M.D. At approximately 2,200 feet elevation east of the Samotua River, 3 miles southeast of the junction of the Sheslay and Samotua Rivers.

CLAIMS: TITO 1 to 20.

ACCESS: By helicopter from Telegraph Creek, 44 miles.

OWNER: HUDSON'S BAY OIL & GAS COMPANY LIMITED, 171 Pemberton Avenue, North Vancouver.

METAL: Copper.

DESCRIPTION: Minor copper mineralization is associated with a small syenitic stock intruding Triassic andesites.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet and geochemical soil survey, 43 samples covering all claims.

MIKE (No. 72, Fig. G)

LOCATION: Lat. 58° 44'-45' Long. 133° 15'-19' (104K/11W)
ATLIN M.D. At approximately 4,000 feet elevation on Red Cap Creek, 1 mile east of the Taku River.

CLAIMS: MIKE 1 to 32 (formerly RED CAP).

ACCESS: By helicopter from Tulsequah, 12 miles.

OWNER: SUN OIL COMPANY, 503 North Central Expressway, Richardson, Texas 75080.

METALS: Copper, molybdenum.

DESCRIPTION: Silicified, carbonatized, and pyritized Stuhini and King Salmon volcanic rocks near the margin of a small granodiorite stock contain quartz-carbonate veins with pyrite, chalcopyrite, galena, sphalerite, arsenopyrite, and molybdenite.

WORK DONE: Geochemical survey.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 51.

POTLATCH-BANKER (No. 77, Fig. G)

By B. M. Dudas

LOCATION: Lat. 58° 40' Long. 133° 32' (104K/12W)
ATLIN M.D. On the east side of Tulsequah River, about 3 miles north of the Taku and Tulsequah Rivers junction.

(104M/1E)

CLAIMS: Seventy-five Crown-granted claims including the JANET, JOKER, and BANKER.

ACCESS: By aircraft or boat from Juneau, Alaska, or by aircraft from Atlin or Whitehorse.

OWNER: NEW TAKU MINES LIMITED, 755, 555 Burrard Street, Vancouver 1.

METALS: Gold, silver, copper, lead, zinc.

DESCRIPTION: The showings are on the northeast side of the Tulsequah River, mostly under heavy overburden. The mineralization is mainly sphalerite and galena with minor tetrahedrite, chalcopyrite, arsenopyrite, and stibnite, and abundant pyrite.

WORK DONE: Three men spent about a month in September rehabilitating the camp which earlier in the year was damaged by vandalism. Vandals broke into almost every building and some mobile equipment was also damaged. The property had no watchman for the past two years. Some of the buildings are deteriorating beyond repair. Other than repairing buildings, no work was done on the property.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 52; *Geol. Surv., Canada,* Mem. 248 and 362.

SKAGWAY 104M

MOLLY (No. 19, Fig. G)

LOCATION: Lat. 59° 14'-16' Long. 134° 08'-12' (104M/1E)
ATLIN M.D. At an elevation of 3,500 feet on the south side of Willison Bay, west of Hoboe Creek, 30 miles southwest of Atlin.

CLAIMS: MOLLY, FAYE, totalling 68.

ACCESS: By air or water from Atlin, 30 miles.

OPERATOR: COMINCO LTD., 800, 1155 West Georgia Street, Vancouver 5.

METALS: Molybdenum, copper.

DESCRIPTION: Hornblende granodiorite related to the Coast Intrusions is intruded by biotite granodiorite and younger alaskite mineralization consisting primarily of molybdenite with lesser pyrite and chalcopyrite is closely associated with the alaskites. High-grade mineralization is confined to zones of breccia formed near the contacts between alaskite and granodiorite.

WORK DONE: Induced polarization survey, 8 line-miles covering 13 Molly claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 52; Assessment Report 3734.

NI, FIRE (No. 18, Fig. G)

By A. Panteleyev

LOCATION: Lat. 59° 27.8′ Long. 132° 47.5′ (104N/7, 10)
ATLIN M.D. At elevations of 3,000 to 6,080 feet 1.5 miles southeast of Mount Sandford, 32 miles east-southeast of Atlin.

CLAIMS: NI 1 to 40, FIRE 1 to 120, 125, 126, DOG 1 to 126, LINE 1 to 18, 23 to 182, KOW 1 to 19 Fractions, TOW 1 to 30, RED 50 to 53 Fractions, WIND 3 to 6.

ACCESS: By helicopter from Atlin, 32 miles east-southeast.

OWNER: CANADIAN JOHNS-MANVILLE COMPANY LIMITED, Box 1500, Asbestos, P.Q.

METALS: Molybdenum, copper.

DESCRIPTION:

A small Eocene ? porphyry stock intrudes northeasterly trending cherts, siliceous argillites, and argillites of the Cache Creek Group. The stock measures 350 by 1,200 feet and has its long axis parallel the trend of the bedded rocks. Contacts are difficult to recognize due to poor exposure, rock alteration, and weathering affects. A pronounced reddish brown gossan has formed over the mineralized zone and oxidation with some surficial leaching is known to depths of 90 feet.

The intrusive rock is a weakly miarolitic, leucocratic, medium to coarse-grained (biotite) quartz feldspar porphyry with phenocrysts up to 1.5 centimetres set in a fine-grained quartz feldspar matrix. Study of two specimens of diamond-drill core (DDH 5, 205 and 337 feet) shows that phenocrysts of plagioclase, occasional quartz, and rare K-feldspar form about 15 per cent of the rock. The matrix consists of a graphic to aplitic intergrowth of about equal amounts of plagioclase, K-feldspar, and quartz. A total of about 1 per cent biotite as well as minor apatite, sericite, carbonate, clay, and pyrite are seen in thin section. The rock composition is leucogranodiorite to alaskite.

Molybdenum mineralization is found in a silicified zone encompassing the stock, its contact, and peripheral brecciated chert beds. Molybdenite occurs mainly in quartz veinlets but also in vuggy fractures lined with crystalline quartz, pyrite, and siderite. An extensive zone with disseminated pyrite and pyrrhotite presumably flanks the molybdenum-bearing intrusive core. Minor chalcopyrite and traces of galena, sphalerite, and arsenopyrite have been reported from drill core by company geologists and this study found traces of scheelite in the porphyry.

WORK DONE: Claims and topography mapped; surface geological mapping, 1 inch equals 400 feet; magnetometer survey, 22 line-miles; and geochemical soil survey, 560 samples covering Ni, Fire, and Kow claims; surface diamond drilling, six holes totalling 4,904 feet on Ni 5, 10, 11, 30, Fire 5, and Kow 11.

REFERENCES: Assessment Reports 3733, 3782, 3867, 4435, 4436, 4437.

CANDY (No. 4, Fig. G)

LOCATION: Lat. 59° 40′ Long. 132° 56′ (104N/10W)
ATLIN M.D. Twenty-eight miles northeast of Atlin.

CLAIMS: CANDY, WHI, HOT, KEL, GO, totalling 154.

ACCESS: By helicopter from Atlin.

OWNER: CANADIAN JOHNS-MANVILLE COMPANY LIMITED, Box 1500, Asbestos, P.Q.

METAL: Molybdenum.

DESCRIPTION: Molybdenite occurs in quartz-filled fractures in porphyry.

WORK DONE: Geological, geochemical, and induced polarization surveys during 1971.

REFERENCES: Assessment Reports 3567, 3568, 3569.

GARNET (No. 20, Fig. G)

LOCATION: Lat. 50° 40.5′ Long. 133° 25.5′ (104N/11W)
ATLIN M.D. On the west side of Boulder Creek, 2.5 miles upstream from its mouth.

CLAIMS: GARNET 1 to 4.

ACCESS: By road from Atlin, 12 miles.

OWNER: CANADIAN JOHNS-MANVILLE COMPANY LIMITED, Box 1500, Asbestos, P.Q.

METALS: Tungsten, molybdenum.

DESCRIPTION: Numerous quartz veins in alaskite, quartzite, and limestone are mineralized with wolframite, molybdenite, and galena.

WORK DONE: Magnetometer survey.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 30; Assessment Report 3732.

ADERA (No. 74, Fig. G)

By B. M. Dudas

LOCATION: Lat. 59° 42.5′ Long. 133° 24.2′ (104N/11W)
ATLIN M.D. On upper Ruby Creek, some 21 miles by road from Atlin, extending from 4,800 feet to about 5,100 feet elevation.

CLAIMS: Twelve ADERA, KEY 1 to 44, RV 1 to 8, PACIFIC 1 and 2, BOY 1 and 2, ZAP 5 to 20, plus 68 contiguous claims held by option. (The Adera claims cover the main showing.)

ACCESS: Twenty-one miles by road from Atlin, via Pine Creek, Surprise Lake, and Ruby Creek to a multi-trailer camp.

OWNER: ADANAC MINING AND EXPLORATION LTD., 908, 1111 West Hastings Street, Vancouver 1.

METALS: Molybdenum, tungsten.

DESCRIPTION:

The body of molybdenite mineralization on the Adera claims occurs at the periphery of a small boss called the Mount Leonard Boss which in all probability is connected at shallow depth to the main Surprise Lake batholith. Both the boss and the main batholith are composed very largely of alaskite, that is, two-feldspar granite with less than 5 per cent mafic minerals. The Mount Leonard Boss intrudes a sequence of rocks ranging from the Permo-Pennsylvanian Cache Creek metavolcanic rocks, with remnants of the ultramafic Atlin Intrusions of similar age, to the Fourth of July batholith of probable Jurassic age. The alaskite intrusions are judged to be of mid-Cretaceous age. They are overlain by valley-filling flows of olivine basalts and on Ruby Mountain by the remnants of a central volcano that is Late Tertiary and Pleistocene.

WORK DONE: Work was limited to maintaining camp and road, and resampling of the underground workings completed in 1970. At year-end it was announced that Climax Molybdenum Corporation of British Columbia Limited had been given an option to place the property in production.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, pp. 29-35; 1970, p. 28; 1971, p. 53.

HOBO (No. 5, Fig. G)

LOCATION: Lat. 59° 44.0′ Long. 133° 21.2′ (104N/11W)
ATLIN M.D. At an elevation of 4,500 feet at the headwaters of Ruby and Cracker Creeks, 17 miles northeast of Atlin.

CLAIMS: HOBO, X, AT, totalling 107.

ACCESS: By road from Atlin, 17 miles.

OWNER: CANADIAN JOHNS-MANVILLE COMPANY LIMITED, Box 1500, Asbestos, P.Q.

METALS: Copper, molybdenum, silver, lead, tungsten.

WORK DONE: Geochemical survey covering Hobo 172-175 and X1-8, 13-18 during 1971.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*,G.E.M., 1970, p. 29; Assessment Reports 3425, 3571.

NORSK (No. 6, Fig. G)

LOCATION: Lat. 59° 42′ Long. 133° 46′ (104N/12)
ATLIN M.D. On the east side of Atlin Lake, 10 miles north of Atlin.

CLAIMS: NORSK, BALM, SALLY, totalling 24.

ACCESS: By road from Atlin.

OWNER: CANADIAN JOHNS-MANVILLE COMPANY LIMITED, Box 1500, Asbestos, P.Q.

METAL: Molybdenum.

DESCRIPTION: Molybdenite is associated with quartz veins and stringers in granite and occasionally along lamprophyre-granite contacts.

WORK DONE: Induced polarization survey covering Norsk 5-8 during 1971.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 37; Assessment Report 3570.

SWAN (No. 34, Fig. G)

LOCATION: Lat. 59° 16.5' Long. 131' 18' (104O/6W)
ATLIN M.D. At approximately 4,400 feet elevation at the head of Tahoots Creek, 7 miles due east of the north end of Kedahda Lake.

CLAIMS: SWAN, totalling 38.

ACCESS: By helicopter from Dease Lake, 75 miles.

OWNER: UNION MINIERE EXPLORATIONS AND MINING CORPORATION LIMITED, 200, 4299 Canada Way, Burnaby 2.

METAL: Molybdenum.

DESCRIPTION: The property is underlain by a coarse-grained, granite porphyry forming part of the Glundebery batholith. Locally granite phases have been mapped containing many dioritic inclusions. Quartz molybdenite veins have been seen in float.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 1,000 feet; induced polarization survey, 3.2 line-miles covering Swan 39-50; electromagnetic survey, 2.7 line-miles covering Swan 41-44; surface diamond drilling, two holes totalling 181 feet on Swan 43 and 44.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 55; Assessment Report 3971.

RAM (No. 48, Fig. G)

LOCATION: Lat. 59° 48.6' Long. 131° 44.5' (104O/13)
ATLIN M.D. At approximately 4,000 feet elevation about 2 miles east of Swift Lake, 10 miles south of Mile 755 on the Alaska Highway.

CLAIMS: RAM 1 to 20.

ACCESS: By four-wheel-drive vehicle or skidoo bombardier from Mile 755 on the Alaska Highway, 10 miles.

OWNER: J.J.A. Altenburg.

OPERATOR: NIZI ZINC & METAL MINING LIMITED, 7926 Wedgewood Street, Burnaby 1.

METAL: Gold.

DESCRIPTION: A shear zone contains mineralization. Chalcopyrite, native gold, and tellurides are said to be present.

WORK DONE: Geochemical soil and silt survey, 800 samples covering all claims; trenching, 60 feet on Ram 6, 11, and 12.

REFERENCE: Assessment Report 4094 (line-cutting).

HOLLIDAY-RANSON (No. 30, Fig. G)

LOCATION: Lat. 60° 00' Long. 130° 34' (104O/15E)
LIARD M.D. Between elevations of 4,000 and 6,000 feet at the head of West Freer Creek, 5 miles south of Mile 708 on the Alaska Highway.

CLAIMS: SANDY 1 to 44 (1 to 24 in Yukon).

(1040/16W)

ACCESS: By secondary road from the Alaska Highway, 5 miles.

OWNER: *YUCOL MINES LTD., 8167 Main Street, Vancouver 4.*

METALS: Silver, lead.

DESCRIPTION: Mineralization occurs in quartz veins in biotite-quartz monzonite of the Cassiar batholith.

WORK DONE: Geological, magnetometer, and electromagnetic surveys on Sandy 35-38.

REFERENCES: *Minister of Mines, B.C.* Ann. Rept., 1949, p. 69; Assessment Report 3844.

AMY (No. 13, Fig. G)

LOCATION: Lat. 59° 55.3' Long. 130° 14.0' (104O/16W)
LIARD M.D. Between elevations of 4,000 and 5,000 feet 2.5 miles northwest of the north end of Tootsee Lake, 80 miles west-southwest of Watson Lake.

CLAIMS: FLO 1 to 4, LEO 1 and 2.

ACCESS: By helicopter from Watson Lake.

OWNER: FOSCO MINING LTD., 1902, 10015 – 103rd Avenue, Edmonton, Alta.

METALS: Silver, lead, zinc.

DESCRIPTION: Galena, sphalerite, and tetrahedrite occur in limestone close to a granite contact.

WORK DONE: Feasibility study.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1949, p. 70; 1965, p. 10; Assessment Reports 734, 3566.

LUCK (No. 67, Fig. G)

LOCATION: Lat. 60° 00' Long. 130° 27' (104O/16W)
LIARD M.D. Between 3,500 and 4,000 feet elevation on Freer Creek, near Mile 706 on the Alaska Highway, 70 miles west of Watson Lake.

CLAIMS: LUCK 1 to 6, 23 to 28, CONE 1 to 6.

ACCESS: By four-wheel-drive vehicle road from Mile 706 on the Alaska Highway, 8 miles.

OWNER: CONE MT. MINES LTD., 8167 Main Street, Vancouver 15.

METALS: Silver, copper, lead, zinc.

DESCRIPTION: Argentiferous galena, sphalerite, and chalcopyrite are found in quartz veins and east-west fractures near a northerly trending lamprophyre dyke in quartz monzonite intrusions of the Cassiar batholith.

WORK DONE: Geochemical soil survey, 211 samples covering Luck 26 and 28.

REFERENCE: Assessment Report 3843.

ATAN (No. 32, Fig. G)

LOCATION: Lat. 59° 12′ Long. 129° 12′ (104P/3E)
LIARD M.D. At approximately 2,400 feet elevation 1.5 miles east of McDame Post on the north side of Atan Lake, 23 miles east of Cassiar.

CLAIMS: ATAN, SKI, ADAIR, FOX, WOLF, totalling 46.

ACCESS: By four-wheel-drive vehicle from Good Hope Lake on the Cassiar-Watson road, 9.5 miles.

OWNER: TOURNIGAN MINING EXPLORATIONS LTD., 704, 535 Thurlow Street, Vancouver 5.

METALS: Barite, lead, silver, copper, zinc.

DESCRIPTION: Barite-lead-silver-copper-zinc mineralization is found as replacement filling in brecciated Atan Group carbonate rocks.

WORK DONE: Surface workings mapped; surface geological mapping, 1 inch equals 50 feet covering Ski and Atan claims; trenching and stripping, 125,000 square feet on Ski 3.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 56.

JOEM, RAIN, DAKO (No. 60, Fig. G)

By A. Panteleyev

LOCATION: Lat. 59° 20′ Long. 129° 28.5′ (104P/6W)
LIARD M.D. At 5,000 feet elevation 1 mile southeast of the summit of Mount Haskin, 20 miles east of Cassiar.

CLAIMS: JOEM, RAIN, DAKO, etc., totalling 135.

ACCESS: By a 4.5-mile access road leaving the Cassiar-Stewart Highway 8.2 miles south of Good Hope Lake.

OWNER: DELLA MINES LTD., 1307, 1030 West Georgia Street, Vancouver 5.

METALS: Copper, silver, zinc, bismuth.

DESCRIPTION:

Base-metal occurrences have been known on Mount Haskin and Mount Reed from before the first world war. They occur over a distance of 2 miles in a northwesterly trending belt of Lower Cambrian Atan Group carbonate rocks, shales, and siliceous sedimentary rocks. Mineralization consists of structurally and lithologically controlled sulphide replacements containing zinc, lead, silver, copper, and bismuth as well as stockwork molybdenum and molybdenum-tungsten deposits associated with granite porphyry intrusions.

Westerly dipping strata are locally deformed by small folds and steep faults trending both parallel and transverse to the bedding. Faults are the most important structural element since they localized emplacement of small plugs, dykes, and sills of granite porphyry and allowed passage of mineralizing fluids into beds and intrusive contacts favourable for sulphide deposition. In some cases the faults themselves became sites of deposition and this type of mineralization is characterized by high lead-silver content (Derry, 1949). The age of mineralization is believed to be the same as the granite porphyry intrusions and has been determined by K-Ar dating to be Eocene (Christopher, *et al.* 1972) (Mount Haskin granite porphyry – 49.7±1.5, 50.5±1.5 m.y. and Mount Reed granite porphyry –

48.7±1.9, 50.2±1.6 m.y.). Post-mineralization movements on transverse (northeast to east-northeast) faults complicate the geology and disrupt the continuity of some of the mineralized zones.

Della Mines Ltd. has investigated a molybdenum-bearing zone associated with the granite stock on Mount Haskin and on the basis of 21 diamond-drill holes has reported 13.5 million tons averaging 0.15 per cent molybdenite to a depth of 500 feet. Since 1971 work has been concentrated on the east slope showings (Della 'B' zone) about 1 mile southeast of the granite porphyry stock. Here pyrrhotite, sphalerite, chalcopyrite, some pyrite, galena, and supposedly native bismuth and bismuthinite are found in lenses and disseminated replacements along limestone contacts with chert, siliceous argillite, and granitic dykes or sills. The mineralized limestone beds have been silicified and metasomatized to a dense, fine-grained calc-silicate rock.

To date a strike length of approximately 1,300 feet has been followed underground but the geometry and continuity of the mineralization is complicated by faulting. The mineralization has an overall dip of about 40 degrees to the west. The 1972 exploration programme extended the adit by about 500 feet on a more northerly heading and a crosscut was driven westward into the hangingwall from near the end of the adit. A new portal was prepared to the east of the Della 'B' adit some 250 feet lower in elevation and a future exploration programme is expected to advance this adit westward to test the down-dip continuity of the mineralization.

WORK DONE: Underground workings mapped; surface geological mapping, 1 inch equals 50 feet covering Dako 2; underground geological mapping, 1 inch equals 20 feet covering Joem 1 and 2; road construction, 4.5 miles; trenching, 1,386 feet on Dako 2; stripping, 6,956 square feet on Dako 2; underground work, 1,342 feet of tunnelling on Joem 1 and 2; underground diamond drilling, 25 holes totalling 3,872 feet on Joem 1 and 2.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 57, 58; Derry, D. R., 1949, Assessment Report 48; Gabrielse, Hubert, 1963, *Geol. Surv., Canada,* Mem. 319, McDame Map-area, Cassiar District, British Columbia, 138 pp.; Christopher, P. A., White, W. H., and Harakal, J. E., 1972, Age of Molybdenum and Tungsten Mineralization in Northern British Columbia, *Can. Jour. Earth Sc.,* Vol. 9, No. 12, pp. 1727-1734.

TATSHENSHINI RIVER 114P

BORNITE, CAT (No. 31, Fig. G)

LOCATION: Lat. 59° 34.6' Long. 136° 35.7' (114P/10E)
ATLIN M.D. At approximately 4,000 feet elevation on the south slope of Mineral Mountain in the Rainy Hollow area, 3 miles southwest of Mile 53 on the Haines road.

CLAIMS: CAT 1 to 253.

ACCESS: By Haines road, 110 miles south from Haines Junction.

(114P/10E)

OWNER: Panther Mines Ltd.

OPERATOR: CANEX PLACER LIMITED (formerly Canex Aerial Exploration Ltd.), 800, 1030 West Georgia Street, Vancouver 5.

METALS: Copper, molybdenum, lead, zinc.

DESCRIPTION: Granitic rocks in a zone of brecciation or multiple intrusion contain copper and molybdenum mineralization over an area 800 feet by 400 feet on Cat 92. Skarn mineralization occurs in metasedimentary rocks to the south of this area.

WORK DONE: Surface geological mapping, 1 inch equals 100 feet covering Cat 92; induced polarization survey, 2 line-miles covering Cat 92, 113, and 115; road construction, 2 miles on Cat 91-93, 112, 114, and 115; stripping, 25,000 square feet on Cat 2, 11, 13, 44, 62, 63, and 84; surface diamond drilling, four holes totalling 1,088 feet on Cat 92 and 115.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 23.

LUNAR (No. 7, Fig. G)

LOCATION: Lat. 59° 41' Long. 136° 37.2' (114P/10E)
ATLIN M.D. Between 3,400 and 4,500 feet elevation 1 mile west of Mile 68.5 on the Haines road.

CLAIMS: LUNAR 1 to 5, 7, 9 to 14, 23, 24; MAG 1, 2, 5, 6; BERG 2, 5 to 8.

ACCESS: By caterpillar trail from the Haines road, 1 mile.

OWNER: ERWIN KREFT, 13 Tutshi Road, Whitehorse, Yukon Territory.

METALS: Silver, lead, zinc.

DESCRIPTION: Metamorphosed Permo-Carboniferous sedimentary rocks are intruded in the southeast corner of the claim group by granodiorite and quartz diorite. Mineralization occurs in southeasterly trending zones as magnetite or pyrrhotite with galena, sphalerite, and silver values.

WORK DONE: 1971 – geochemical survey covering Lunar 1-6, 10, 12, and 14; 1972 – magnetometer survey, 1 line-mile covering Lunar 12-14; geochemical soil survey, 30 samples covering Lunar 23-25 and Berg 2 and 8; trenching, approximately 40 cubic yards on Lunar 1, 5, and 12 and Mag 2 and 5.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 28; Assessment Report 3427.

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PLACER

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GENERAL REVIEW OF PLACER MINING

The price of gold on world markets began to rise early in 1972 and by mid-summer had increased almost by 50 per cent. It was enough to stimulate small-scale mining sufficiently to increase the production of placer gold from 177 ounces worth $4,647 in 1971 to 691 ounces worth $26,905 in 1972.

REPORTS ON PLACER OPERATIONS

MOYIE RIVER

MOYIE RIVER PLACER (No. 196, Fig. A) (82G/5W)

Lat. 49° 25.5' Long. 115° 56.5' Fort Steele M.D.

A large number of placer leases including P.M.L. Nos. 1073, 1075-77, 1085-86, 1088, 1101, 1102, and 1106 are held by J. Pratt of Boswell and associates.

Part of the Moyie River ground was churn-drilled many years ago by Cominco Ltd. at which time a large yardage of gravel containing significant gold values was indicated.

Some prospecting and testing was done in 1972 and several churn-drill holes were put down. A start was made to set up a hydraulic system on lower Palmer Bar Creek.

MAUS CREEK

MAUS MINERALS LTD. (No. 195, Fig. A) (82G/12E)

Lat. 49° 38' Long. 115° 33' Fort Steele M.D.

The company (409 Dieppe Blvd., Lethbridge, Alta.; W. Strickland, manager) holds P.M.L. Nos. 732, 733, 945, and 1126 on Maus Creek, 5 miles northeast of Fort Steele.

The bedrock drift from the foot of the shaft on P.M.L. Mo. 733 was driven on and in bedrock for a distance of 20.5 feet in a southerly direction parallel to Maus Creek.

PERRY CREEK

MESA PETROLEUM (M.A.) CO. (No. 135, Fig. A) (82G/12W)

Lat. 49° 33' Long. 115° 58' Fort Steele M.D.

The company (500 Bow Valley Square, 202 Sixth Avenue SW., Calgary, Alta.) holds P.M.L. Nos. 1004, 1069, and 10 others near the confluence of Perry and Antwerp Creeks about 10 miles west-northwest from Cranbrook.

Seismic work and airphoto interpretation indicate the possibility that an unworked buried drainage system exists downstream from the old Perry Creek placer workings.

A refraction survey was run along 4,000 feet of line on three leases.

PRINCETON

JOY MINING LIMITED (No. 80, Fig. B) (92H/7E)

Lat. 49° 20' Long. 120° 30.5' Similkameen M.D.

The company (390 West Hastings Street, Vancouver 3) holds P.M.L. Nos. 1867, 1868, 1873-76, and 1881-86 on Highway 5 immediately north of Princeton airport.

A hammer seismic survey done on 20 miles of line was recorded in Assessment Report 3505.

TULAMEEN RIVER

HENRIETTA PLACER (No. 271, Fig. B) (92H/7E)

Lat. 49° 29' Long. 121° 39.5' Similkameen M.D.

Henrietta Mines Ltd. (506, 540 Burrard Street, Vancouver 1) holds P.M.L. Nos. 2027-30 on the south side of Tulameen River, 2 miles downstream from Granite Creek.

From a trench 2,295 cubic feet of material was excavated, crushed, and washed and 110 pounds of concentrate was shipped to Germany for separation and smelting.

P.M.L. NOS. 1796 AND 1840 (No. 75, Fig. B) (92H/10W)

Lat. 49° 32.5' Long. 120° 46.5' Similkameen M.D.
Lat. 49° 32' 120° 49.3' Similkameen M.D.

H. C. Morrison (3330 West 117th Street, Inglewood, California) holds P.M.L. No. 1796 on Olivine Creek and P.M.L. No. 1840 on Tulameen River 1 mile west of Tulameen village.

Seismic refraction surveys were made on both leases to determine the depth and configuration of bedrock, and magnetometer surveys were made to detect concentrations of metallic minerals. The results are recorded in Assessment Report 3513.

FRASER RIVER

SHORE EXPLORATIONS LTD. (No. 1, Fig. B) (92I/13W; 92P/4W)

Lat. 50° 58' - 51' 01.5' Long. 121° 53'-55' Clinton M.D.

The company (Box 2767, Station A, Edmonton, Alta.) holds P.M.L. Nos. 544, 567-71, and 573-79 extending along the Fraser River downstream from Leon Creek.

The steeply sloping beaches (about 25 degrees) along the edge of the Fraser River are composed of coarse gravel which contains fine placer gold and platinum.

The leases were examined, the beaches were sampled, and the results were recorded in Assessment Report 3551.

ANTLER CREEK

ANTLER CREEK PLACERS LTD. **(No. 198, Fig. D)** **(93A/14W)**

Lat. 52° 58' Long. 121° 24.5' Cariboo M.D.

The company (11506 -- 109th Avenue, Edmonton, Alta.) holds four placer leases on Nugget Gulch, a tributary of Antler Creek, about 12 miles southeast of Barkerville.

Approximately 250 feet of streambed on the lower placer lease was hydraulicked.

COTTONWOOD RIVER

BRENT EXPLORATIONS LTD. **(No. 146, Fig. D)** **(93G/1W)**

Lat. 53° 05' Long. 122° 15.5'-18' Cariboo M.D.

The company (1897 Third Avenue, Prince George; R. Orr, president) holds P.M.L. Nos. 6951, 6952, 6955, 6956, and 7190 on the Cottonwood River, 4 miles east of Cottonwood station.

The leases were mapped geologically and 74 test pits 3 to 6 feet deep were excavated by backhoe.

LIGHTNING CREEK

HARCOL PLACER PRODUCTION LIMITED **(No. 197, Fig. D)** **(93G/1E)**

Lat. 53° 01.5' Long. 122° 01' Cariboo M.D.

The company (Box 808, Quesnel) in 1972 held P.M.L. Nos. 5426, 5427, 5698, 5809, 5473, 6015, 6016, and others under option from Hannandor Gold Ltd. and Consolidated Vigor Mines Ltd. The leases are on Lightning Creek at and above the mouth of Angus Creek, 22 miles east of Quesnel along the Barkerville road. Creekbed and hillside gravel benches have been cleared and prepared for mining. The general area has been intermittently tested and mined on a small scale for years. Evaluation and preparatory work was based on testing done by Consolidated Vigor Mines Ltd. in 1970 and 1971.

A washing and screening plant utilizing conveyors and including a jig, with a capacity of 2,000 yards per day, was brought in and assembled. A 1.5-yard dragline casts into the feed hopper on the washing plant. Conveyors transported the waste fraction to spoil piles which were distributed by bulldozer.

The plant was electrically powered. Supply was from a 250-kva. 480-volt mobile diesel generator plant.

Camp facilities for some 30 men were assembled on the property. After two weeks of running-in and operation, the project was suspended on July 24, 1972.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 484.

TANACANA MINES LTD. **(No. 159, Fig. D)** **(93H/4W)**

Lat. 53° 02.5' Long. 121° 59' Cariboo M.D.

The company (39, 444 Victoria Street, Prince George; Keith Morton, director) held P.M.L. Nos. 5332, 6106, 7067, 7068, 7073, 7074, 7092, and 7117 on Lightning Creek at the junction of Wingdam Creek. Since 1952 the ground had been held and worked by Cherubino Cavadini.

An area about 500 feet square in the southwest corner of P.M.L. No. 7074 has been cleared preparatory to mining.

In 1972 a refraction survey was made over an area about 300 feet square on P.M.L. No. 5332 and a test pit 30 feet in diameter and 14 feet deep was excavated. Concentrates from the 1971 operation were also treated.

A power plant, washing plant, dragline, and other related equipment are on the property. Capacity of the washing plant is estimated to be 500 cubic yards per day.

P.M.L. NOS. 6707 AND 6708 **(No. 159, Fig. D)** **(93H/4W)**

Lat. 53° 02.5' Long. 121° 59' Cariboo M.D.

Bud Henning (Box 1720, Quesnel) held P.M.L. Nos. 6707 and 6708 under option from Consolidated Vigor Mines Ltd. The leases are on Lightning Creek at the junction of Wingdam Creek and are 23.5 miles east of Quesnel along the Barkerville road.

A section of the south bank of Lightning Creek and a bench on the southeast corner of P.M.L. 6708 have been stripped and cleared for mining.

An area 400 by 800 feet was cleared and tested; a mobile camp and facilities were installed; and power plant, process and domestic water wells and washing plant were established. Estimated capacity of the washing plant is 300 cubic yards per day.

SULPHURETS CREEK

SULPHURETS CREEK PLACER **(No. 81, Fig. G)** **(104B/8W, 9W)**

Lat. 56° 30' Long. 130° 21.3' Skeena M.D.

Five leases on Sulphurets Creek at the junction of Mitchell Creek are held by C. L. Kilbury (of Ketchikan, Alaska) and associates. The ground was worked for about two months, a cabin was built, and a dragline was set up near the mouth of Mitchell Creek.

TURNAGAIN RIVER

P.M.L. NOS. 893, 1027, 1032 **(No. 80, Fig. G)** **(104I/9E)**

Lat. 58° 39.5' Long. 128° 05.5' Liard M.D.

El Paso Mining and Milling Company hold three leases on Turnagain River at the junction of Cassiar River. Two test pits were sunk on P.M.L. Nos. 1027 and 1032.

ATLIN AREA

Placer mining activity in the Atlin area continued to be depressed. Assessment work was done by miners on leases on Birch, McKee, Otter, Pine, Ruby, Spruce, and Wright Creeks and O'Donnel River.

McKEE CREEK (No. 85, Fig. G) (104N/5E)

Lat. 59° 28' Long. 133° 33' Atlin M.D.

Antonio Vesnaver for six weeks drift mined on McKee Creek about half a mile above the bridge. He drove 30 feet of adit on bedrock on the north side of the creek and washed about 10 to 12 wheelbarrows of gravel per day.

OTTER CREEK (No. 86, Fig. G) (104N/11W)

Lat. 59° 36.5' Long. 133° 23.5' Atlin M.D.

Wenzel Rothbauer for two weeks with a D-8 Caterpillar worked the lower part of Otter Creek.

BIRCH CREEK (No. 82, Fig. G) (104N/11W)

Lat. 59° 37.5' Long. 133° 28.7' Atlin M.D.

Cecil and Hazel Guyett worked on a small scale on Birch Creek for about two months. They took advantage of a good run of water and hired a D-7 Caterpillar for a couple of weeks.

PINE CREEK (No. 83, Fig. G) (104N/12E)

Lat. 59° 35.8' Long. 133° 32' Atlin M.D.

Karl Seiger and Wenzel Rothbauer worked the north bank of Pine Creek above Discovery with a 950 Caterpillar, front-end loader, and a D-8 Caterpillar. Tailings and overflow from this operation were deposited in an abandoned gravel pit.

SPRUCE CREEK (No. 84, Fig. G) (104N/12E)

Lat. 59° 33.8' Long. 133° 33.5' Atlin M.D.

Thomas Osborn for about two and one-half months worked on P.M.L. No. 1677, about 2.5 miles south of the Pine Creek bridge. Gravel excavated by a backhoe was washed with water delivered by pump at 50 gallons per minute.

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STRUCTURAL MATERIALS AND INDUSTRIAL MINERALS

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GENERAL REVIEW OF STRUCTURAL MATERIALS AND INDUSTRIAL MINERALS

By J. W. McCammon

Exploration work was done on several industrial mineral showings in British Columbia during the year 1972. The J asbestos prospect southwest of Letain Lake received more attention. Barite properties near Mile 548 and Muncho Lake on the Alaska Highway were surveyed, and a large new find was reported near Atan Lake. The diatomite-pozzolan mill at Quesnel was tested with more experimental runs and some production was made. Considerable mapping, drilling, and trenching were done on the Liard Hot Springs fluorite deposits, and some surveying was performed on a similar showing at Muncho Lake. Limited examination and a little drilling were carried out at the Rexspar fluorite property. Increasing interest was shown in gravel deposits near Vancouver, and one deposit on the east side of Texada Island was drilled. On the same island limestone beds were tested by drilling at several places. Further investigation was done on the large magnesite property east of Radium. More diamond-drill holes were bored to test phosphate beds south of Corbin. Silica was investigated near Golden and Greenwood, and a silica sand occurrence received additional attention near North Bend.

Production continued about normal at established pits and quarries. A new lime-burning kiln went into production at a plant near Port Kells.

REPORTS ON COMMODITIES

ASBESTOS

TOM, EK (No. 76, Fig. A)

LOCATION:	Lat. 51° 04.8′	Long. 117° 08.8′	(82K/3E)

Report on this property under metals in section 82K/3E.

D, R (No. 129, Fig. B)

LOCATION:	Lat. 49° 31.8′	Long. 120° 53.5′	(92H/10W)

Report on this property under metals in section 92H/10W.

J (No. 22, Fig. G)

LOCATION:	Lat. 58° 15' Long. 128° 49' (104I/2W, 7W) LIARD M.D. Between 4,750 and 5,300 feet elevation on the slope southeast of a small lake 3.25 miles southwest of Letain Lake, about 45 miles southeast of Dease Lake.
CLAIMS:	J 1 to 8.
ACCESS:	By helicopter southeast from Dease Lake, 45 miles.
OWNER:	TOURNIGAN MINING EXPLORATIONS LTD., 704, 535 Thurlow Street, Vancouver 5.
DESCRIPTION:	A serpentine mass approximately 3,200 feet long and 400 feet wide contains variable amounts of chrysotile asbestos with fibre length that averages one-quarter of an inch.
WORK DONE:	Magnetometer survey, 8 line-miles covering J 1-8.
REFERENCES:	*B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 450; Assessment Report 3628.

ASB (No. 63, Fig. G)

LOCATION:	Lat. 58° 29' Long. 129° 15' (104I/6) Report on this property under metals in section 104I/6.

CASSIAR MINE (No. 79, Fig. G)

By T. M. Waterland

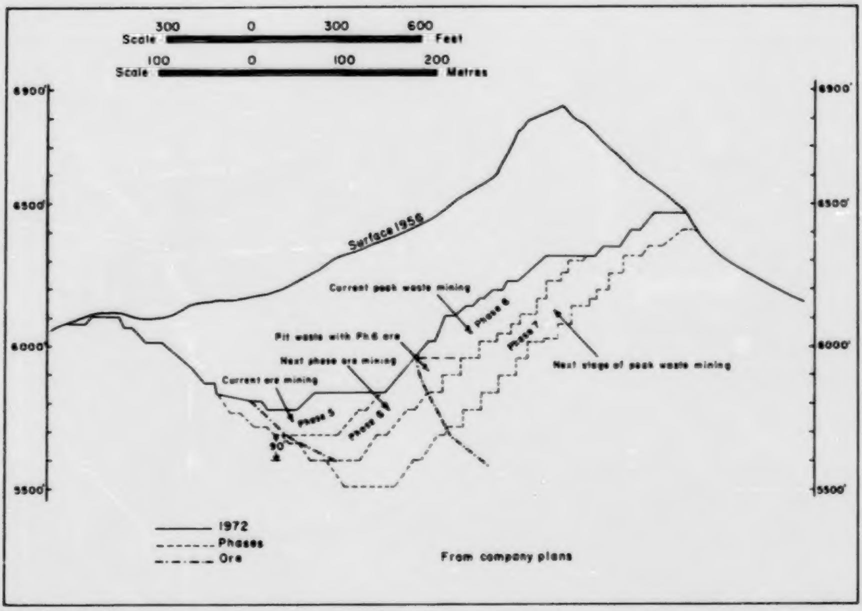
LOCATION:	Lat. 59° 19.6' Long. 129° 49.4' (104P/5W) LIARD M.D. On Mount McDame, 3 miles north of Cassiar, at 5,870 to 7,000 feet elevation.
CLAIMS:	Forty-two Crown granted and five leased.
ACCESS:	By gravel and paved road 86 miles southwesterly from Mile 648.8, Alaska Highway. The mine is 7 miles by road from the Cassiar townsite.
OWNER:	CASSIAR ASBESTOS CORPORATION LIMITED, 1001, 85 Richmond Street West, Toronto, Ont.; mine office, Cassiar.
WORK DONE:	

MINING OPERATION: The Cassiar orebody is mined by open-pit methods. The current mining rate is 1,100,000 tons of ore and 3,700,000 tons of waste per year.

Due to the dip of the orebody, the footwall of the pit is following the footwall of ore and is a final wall as mined. The hangingwall is removed in slices of 175-foot horizontal width and retreated as the pit deepens.

The hangingwall of the pit now extends approximately 1,000 feet and the footwall approximately 500 feet vertically above the pit floor. The ends of the pit are developing into pit walls where previously they were open. The overall slope of the hangingwall is designed at 45 degrees and the footwall at 38 degrees or less.

The orebody is mined in stages, with each stage consisting of three 30-foot benches of ore in the pit bottom and an equivalent retreat of the hangingwall to expose the next three benches of ore. This is illustrated on Figure 69. The hangingwall and footwall of the pit as they existed in 1971 are shown in Plates XXIA and XXIB. Normally two or three ore benches are exposed and mining is selective. The ore is graded into three types to produce different mill products and these are mined separately for different mill runs.


300
0
300
600
Scale
Feet
100
0
100
200
Scale
Metres
6900'
6500'
6000'
5500'
Surface 1956
Current peak waste mining
Phase 6
Pit waste with Ph.6 ore
Next phase ore mining
Current ore mining
Phase 5
Phase 6
Phase 7
Next stage of peak waste mining
90°
1972
Phases
Ore

From company plans

Figure 69. Cassiar Asbestos Corporation Limited. Section of open pit illustrating mining sequence. (*Courtesy Cassiar Asbestos Corporation Limited.*)

Blastholes in ore mining are 6.25 inches in diameter. They are drilled on a nominal 14-foot by 14-foot pattern to 10 per cent below bench grade. The holes are charged with 250 pounds of AN/FO explosives and 1 pound Procore III primers and are loaded to within 13 feet of the collar. Blasts break from 5,000 to 50,000 tons per blast, averaging 25,000 tons, to achieve a powder factor of 0.49 pound per ton.

Pit ore is loaded with 2½-cubic-yard power shovels with 10-cubic-yard or 5-cubic-yard front-end loaders as back up. Haulage trucks are 35, 40, and 50-ton units. The ore-mining rate is from 3,500 to 4,500 tons per day on a three-shift basis.

Waste serpentine and argillite on the hangingwall immediately above the ore is mined as a separate operation. Blastholes in this section are 9 inches in diameter and are drilled to approximately 15 per cent below subgrade. Drill patterns in this waste section are approximately 20 feet by 20 feet. Loading is with 3½-cubic-yard shovels backed up by front-end loaders as in the ore-mining programme. Pit waste mining is carried out at a rate of approximately 500,000 tons to 1,000,000 tons per year.

The peak waste operation is the removal of the mountainside on the hangingwall which is composed of argillite and volcanic rock with serpentine in the lower part. This waste is removed in 30-foot benches. Blasthole drilling and spacing is the same as in the pit waste mining. Explosive charges in both the pit waste and the peak waste consist of 200 pounds of F-3 Hydromex in the toe and 400 pounds of AN/FO loaded to 12 feet from the collar. Holes are blasted with 10, 15, and 25-millisecond delays. The powder factor for waste mining is approximately 0.52 pound per ton.

Pit waste is loaded with a 4½-yard electric shovel powered by a portable diesel-electric generating plant. Front-end loaders are used for back-up work. Haulage is with 35, 40, and 50-ton end-dump trucks. Waste mining runs up to 5,000 tons per shift.

TRANSPORTATION OF ORE: Pit ore is first passed through the primary concentrating plant where approximately 25 per cent of the feed is disposed of in a tailings dump at the minesite. The balance of the ore is transported by aerial tram and truck to the mill located at Cassiar townsite. Approximately 2,000 tons per day can be handled by the tramline with the balance being hauled by contract trucking to the mill.

MILLING: After being dried by oil-fired dryers, the ore is placed in a dry rock storage building, from whence it passes to the top or seventh floor of the mill building and then down through the mill circuit. As the fibre is released, it is collected off the screen by airlifts and taken to collectors at the top of the mill, cleaned, and directed into the packer-bagging circuits.

The longer fibre is collected as it is released and the rock progresses to the next circuit where it is crushed to smaller particles and shorter fibre is released and collected. The tailings are stockpiled for future processing when still shorter fibre may become commercial with decreased shipping costs.

POWER SUPPLY: All electrical power used at Cassiar is generated on site. The power house is equipped with multiple 250 to 1,200-kilowatt diesel-powered motor-generating sets; installed capacity is 6,200 kilowatts.

INDUSTRIAL RELATIONS AND TRAINING: To relieve the increasing shortage of skilled labour, Cassiar Asbestos Corporation Limited carries on a fully integrated personnel training programme. Three full time instructors train heavy equipment operators, heavy duty mechanics, fabricators, and other tradesmen. In addition, learner job training, special clinics, and miscellaneous programmes are provided.

The training programmes are coordinated with the cooperative wage study manual and with Canada Manpower. Classes may run up to 80 hours over a period of six months and, normally, training classes are in off-duty hours and trainees are paid at their regular standard hourly wage rate for training. Arrangements are made for trainees who have become qualified to write for their provincial trade qualifications certificates.

TOWNSITE: The population of the Cassiar townsite is approximately 1,200, including 200 families. There are 225 dwellings in the area, two churches, and an elementary and junior secondary school.

Recreational facilities include a lounge, curling rink, hockey rink, swimming pool, ski hill, tennis courts, and a community centre with lounges and a gymnasium. In addition to company premises, various independent service businesses have been established.

EMPLOYMENT: During 1972, Cassiar employment consisted of approximately 120 staff, clerical, and technical personnel, and 315 hourly paid employees of various classifications.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, pp. 451, 452.

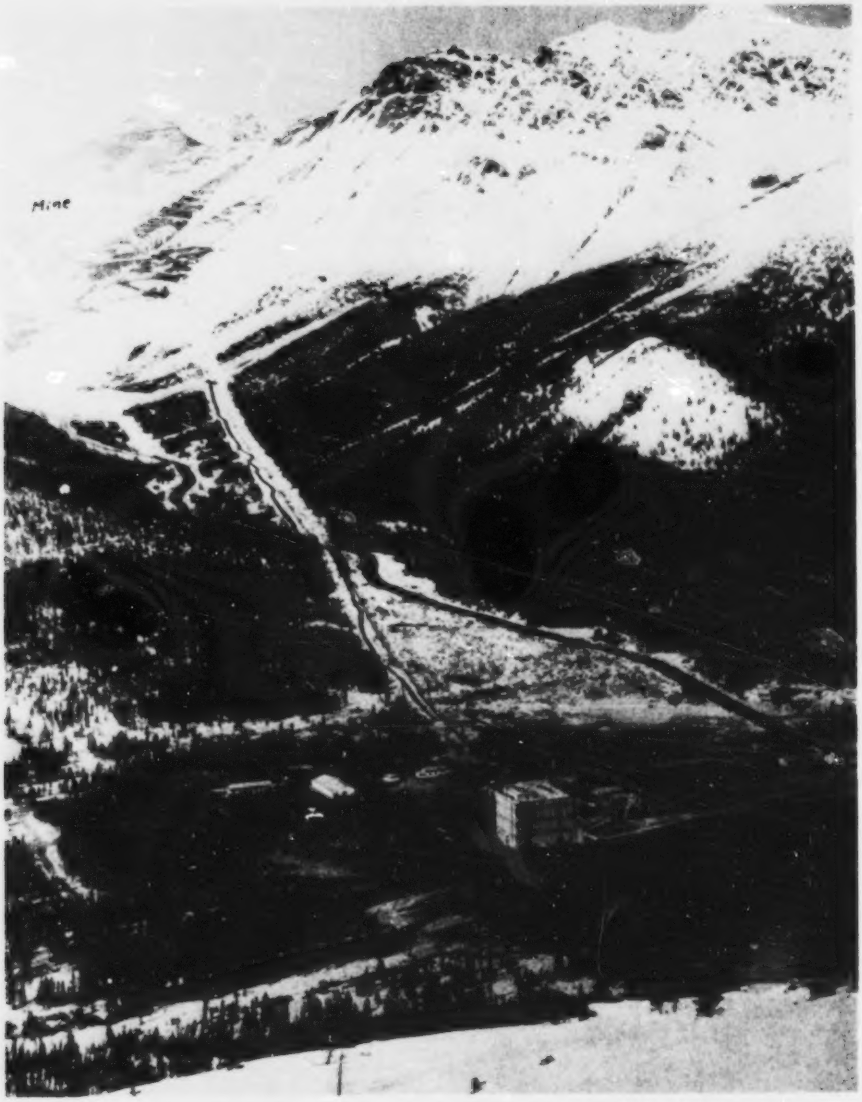


Plate XX. Cassiar Asbestos Corporation Limited. Plant and waste dump in right foreground; road and tramline lead to mine in left distance (April 1972).

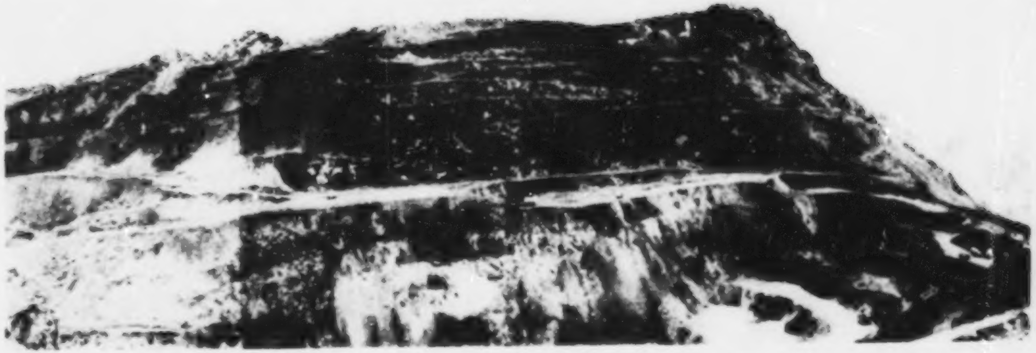


Plate XXIA. Cassiar Asbestos Corporation Limited. View of open pit looking toward the hangingwall side (August 1971).

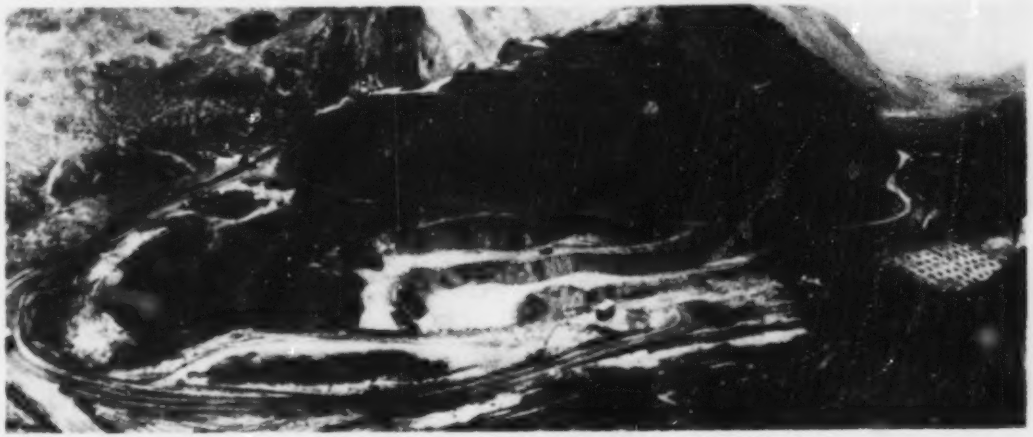


Plate XXIB. Cassiar Asbestos Corporation Limited. View of open pit looking toward the footwall side (August 1971).

BARITE

TOBY CREEK BARITE (No. 147, Fig. A)

By R. W. Lewis

LOCATION: Lat. 50° 21′ Long. 116° 24.4′ (82K/8W)
GOLDEN M.D. Near the southwest corner of Lot 16154 on Toby Creek at the mouth of Jumbo Creek, 20 miles southwest of Invermere.
CLAIM: JUMBO.
ACCESS: By road up the north side of Toby Creek from Wilmer.
OWNER: MOUNTAIN MINERALS LIMITED, Box 700, 529 Sixth Street South, Lethbridge, Alta.
WORK DONE:

In the summer of 1970, Mountain Minerals Limited completed the construction of a plant to recover barite from the tailings pond of the old Mineral King mine. Since then the plant has operated each summer and fall, but is closed during the winter and early spring. The recovered barite concentrate is hauled by truck to the railway at Athalmer for shipment to the company processing plant at Lethbridge.

During 1972, 26,248 tons of barite concentrate was hauled from the recovery plant on Toby Creek to Athalmer and shipped by rail to Lethbridge. Of this 5,000 tons was from stock of the previous year.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 454.

BRISCO BARITE (No. 144, Fig. A)

By R. W. Lewis

LOCATION: Lat. 50° 49.8′ Long. 116° 19.5′ (82K/16W)
GOLDEN M.D. Between Templeton River and Dunbar Creek, 2.5 miles west of Brisco.
CLAIMS: WAMINECA (Lot 15044), CANYON (Lot 15045), SALMON (Lot 15046), CARMINE (Lot 15047), NORTHISLE (Lot 15048).
ACCESS: West from Highway 95 at Brisco, 4.3 miles.
OWNER: MOUNTAIN MINERALS LIMITED, Box 700, 529 Sixth Street South, Lethbridge, Alta.
WORK DONE:

The company resumed operations in the small underground mine in the summer of 1972. Underground operations had previously been suspended at the end of 1970 when the upper working levels of the mine were backfilled with waste rock from the surface quarry.

Three men mined 2,100 tons of barite ore from an extension of the orebody at the lower main level of the mine. The barite ore was crushed and loaded at Brisco and shipped by rail to the company processing plant at Lethbridge.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 454.

BAROID OF CANADA (No. 145, Fig. A)

By R. W. Lewis

LOCATION: Lat. 50° 56′ Long. 116° 29′ (82K/16W)
GOLDEN M.D. At 3,100 feet elevation on the west side of Jubilee Mountain, 5.5 miles northwest of Spillimacheen.
CLAIMS: Former Silver Giant mine property.
ACCESS: By road, 8 miles northwest from Spillimacheen.
OWNER: BAROID OF CANADA, LTD., Box 250, Onoway, Alta.
WORK DONE:

The company owns and operates a plant to recover barite concentrates from the tailings of the former Silver Giant mine. The operation of the plant is seasonal and the plant is shut from early winter to late spring.

A total of 79,809 tons of mine tailings was processed to produce 17,989 tons of barite. The barite was trucked from the plantsite to the railway loading point at Spillimacheen and shipped to the company plant in Onoway for further treatment.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 454.

PARSON BARITE (No. 148, Fig. A)

By R. W. Lewis

LOCATION: Lat. 51° 01.5′ Long. 116° 39′ (82N/2E)
GOLDEN M.D. At 3,700 feet elevation 3.5 miles due south of Parson.
CLAIMS: HILLTOP (Lot 14351), SNOWDROP (Lot 14352), HONEST JOHN (Lot 15734).
ACCESS: By Cranbrook Sawmills logging road south from Highway 93 at Parson, 5 miles.
OWNER: MOUNTAIN MINERALS LIMITED, Box 700, 529 Sixth Street South, Lethbridge, Alta.
WORK DONE: Two operators mined 4,000 tons of barite ore at the quarry and loaded it for shipment to the processing plant at Lethbridge.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 455.

HOMESTAKE (No. 121, Fig. A)

LOCATION: Lat. 51° 06.7′ Long. 119° 49.5′ (82M/4W)
Report on this property under metals in section 82M/4W.

BEAR, MOOSE, BEAVER (No. 21, Fig. E)

LOCATION: Lat. 59° 41.5′-47′ Long. 127° 13′-17′ (94M/14)
LIARD M.D. Four miles north of Milepost 547 on the Alaska Highway, at elevation 2,500 feet, 4 miles south of Hillgren Lakes.
CLAIMS: BEAVER, BEAR, MOOSE, DEER, WOLF, totalling 94.
ACCESS: Six miles by road from mile 547.2 on the Alaska Highway.
OWNER: DRESSER INDUSTRIES. INC., 525, 404 Sixth Avenue SW., Calgary, Alta.

DESCRIPTION: Fractures in argillite are filled with stringers, pods, and veins of barite, some of which are mineralized irregularly with galena and minor sphalerite.

WORK DONE: The Beaver claims were geologically mapped; gravity and magnetometer surveys were run over 20 line-miles on the Beaver, Bear, and Moose claims; 2,000 soil samples were collected for geochemical analyses on the Bear, Moose, and Deer claims; 300 feet of trenching and 2,500 square feet of stripping were done on the Beaver 6 claim; and 15 diamond-drill holes totalling 4,000 feet were drilled on the Beaver, Deer, and Moose claims.

REFERENCES: *Minister of Mines, B.C.,* Ann. Rept., 1965, p. 257; Assessment Reports 767, 2880.

BLACK HILL, NELLIE, BLUE GROUSE (No. 18, Fig. F)

LOCATION: Lat. 55° 57′ Long. 129° 53′ (103P/13E)
Report on this property under metals in section 103P/13E.

ATAN (No. 32, Fig. G)

LOCATION: Lat. 59° 12′ Long. 129° 12′ (104P/3E)
Report on this property under metals in section 104P/3E.

BUILDING STONE

SEBAC (RAMSHEAD) QUARRY (No. 188, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 01.9′ Long. 118° 22.8′ (82E/1W)
Immediately north of the Grand Forks-Christina Lake Highway, about 2 miles east of Grand Forks.

OWNER: SEBAC ENTERPRISES LTD., Box 56, Cascade.

WORK DONE: A modest production of crushed dolomite was attained with sales made mainly at Vancouver. Several truck loads of hand-cobbed quartzite building stone were produced from the same property.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 455.

PORCUPINE CREEK (No. 192, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 15.5′ Long. 117° 03.7′ (82F/6E)
On Porcupine Creek, about 7 miles from Ymir.

ACCESS: Via mining and logging roads along Porcupine Creek from the Ymir-Salmo Highway.

OWNER: Various.

DESCRIPTION: Well-fractured quartzites underlie much of upper Porcupine Creek. The fracturing produces plates and slabs of well-coloured quartzite which is ideal for facing stone.

WORK DONE: Several hundreds of tons of sorted facing stone was produced from several pits and sites. Production was curtailed by disputes over ownership between mineral claim owners and surface title holders.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 491.

DUNCAN ROAD (No. 194, Fig. A)

By P. E. Olson

LOCATION: Lat. 50° 25.4′ Long. 116° 56.4′ (82K/7W)
At the north end of Duncan Lake in the vicinity of Howser and Little Glacier Lakes.

ACCESS: Via the Duncan Valley access road.

OWNER: BRIAN LOGAN, Nelson.

DESCRIPTION: Platy quartzite is exposed along the Duncan Valley road in the vicinity of Howser and Little Glacier Creeks. This material has been recognized as ideal for facing stone production.

WORK DONE: Several truck loads of facing stone were quarried from the side of the road with rejects being dumped over the bank into the Duncan Reservoir.

PITT RIVER QUARRY (No. 144, Fig. C)

By J.W. Robinson

LOCATION: Lat. 49° 17.4′ Long. 122° 39.3′ (92G/7E)
East bank of Pitt River, on the northern side of Sheridan Hill, 4 miles north of Pitt Meadows.

ACCESS: By road, 5 miles from Pitt Meadows.

OWNER: PITT RIVER QUARRIES LTD., 16211 – 84th Avenue, Surrey.

WORK DONE: Eight men quarried 235,000 tons and shipped 215,187 tons of quartz diorite.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 457.

GILLEY QUARRY (No. 143, Fig. C)

By J. W. Robinson

LOCATION: Lat. 49° 19.2′ Long. 122° 40.5′ (92G/7E)
On west bank of Pitt River, immediately south of the mouth of Munro Creek.

ACCESS: By road, 7.5 miles from Coquitlam.

OWNER: CONSTRUCTION AGGREGATES LTD., 850 SW. Marine Drive, Vancouver 14; quarry address, Box 98, Port Coquitlam.

WORK DONE: Thirteen men shipped 343,731 tons of quartz diorite for crushed rock, riprap, and armour rock.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 457.

VALLEY GRANITE PRODUCTS (No. 251, Fig. B)

By J. W. Robinson

LOCATION: Lat. 49° 15.5′ Long. 121° 40.5′ (92H/5E)
West side of Highway 1, 10 miles west of Hope.

ACCESS: By Highway 1.

OWNER: VALLEY GRANITE PRODUCTS LIMITED, 10070 Timberline Place, Chilliwack.

WORK DONE: Granite products, including poultry grits, stucco dash, and sand blast materials, produced 3,886 tons. The resident manager is K. Jessiman. An average of five men was employed during the year. The plant closed on December 15 due to technical difficulties.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 458.

DISTRICT OF KITIMAT QUARRY (No. 29, Fig. F)

By B. M. Dudas

LOCATION: Lat. 54° 05′ Long. 128° 41′ (103I/2E)
On Lot 6072, 1.5 miles north of Kitimat.

ACCESS: North from Kitimat on the Eurocan Logging road, 1.5 miles.

OPERATOR: L.G. SCOTT & SONS CONSTRUCTION LTD., Box 156, Kitimat.

WORK DONE: Bedrock on a section of the logged-off lot was opened up to obtain riprap and ballast. Three men were employed intermittently to drill with an airtrac, blast, and use a Hough-120 front-end loader and a D-8 Caterpillar tractor to supply local demand of approximately 90,000 tons of riprap and 30,000 tons of ballast.

CEMENT

BRITISH COLUMBIA CEMENT COMPANY LIMITED

LOCATION: Lat. 48° 35.1′ Long. 123° 31.2′ (92B/12E)
At Bamberton.

OWNER: BRITISH COLUMBIA CEMENT COMPANY LIMITED, north foot of Columbia Street, Vancouver 4.

WORK DONE: Cement produced, 478,931 tons.

CANADA CEMENT LAFARGE LTD.

LOCATION: Lat. 49° 09.6′ Long. 123° 00′ (92G/3E)
On the Fraser River, south shore of Lulu Island, at the foot of No. 9 road.

OWNER: CANADA CEMENT LAFARGE LTD., head office, 1051 Main Street, Vancouver 4.

WORK DONE: Cement produced, 292,608 tons.

CANADA CEMENT LAFARGE LTD.

LOCATION: Lat. 50° 39.7′ Long. 120° 03.3′ (92I/9E)
On the north bank of the South Thompson River, 11 miles east of Kamloops.

OWNER: CANADA CEMENT LAFARGE LTD., head office, 1051 Main Street, Vancouver 4.

WORK DONE: Cement produced, 113,108 tons.

CLAY AND SHALE

THUNDER HILL (No. 143, Fig. A)

By R. W. Lewis

LOCATION: Lat. 50° 09' Long. 115° 49.9' (82J/4W)
At the bottom of Thunder Hill, 2 miles west of Canal Flats.

CLAIMS: THUNDER HILL 1 and 2.

ACCESS: West from Highway 93 at Canal Flats.

OWNER: MOUNTAIN MINERALS LIMITED, Box 700, 529 Sixth Street South, Lethbridge, Alta.

WORK DONE: The company engaged a mining contractor to drill and blast in the shale quarry. A total of 5,000 tons of shale was prepared, 2,900 tons of which was loaded and shipped by rail to the company plant in Lethbridge for processing.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 459.

HILLBANK SHALE QUARRY (No. 121, Fig. C)

By W. C. Robinson

LOCATION: Lat. 48° 43.1' Long. 123° 39.4' (92B/12E)
On the east bank of Koksilah River, 1 mile southeast of Cowichan Station.

ACCESS: By road from Hillbank.

OWNER: BRITISH COLUMBIA CEMENT COMPANY LIMITED, R.R. 1, Mill Bay.

DESCRIPTION: The quarry is in steeply dipping Upper Cretaceous marine shale of the Haslam Formation.

WORK DONE: Shale produced for use in Bamberton cement plant, 69,250 tons.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 459.

BRITISH COLUMBIA LIGHTWEIGHT AGGREGATES LTD. (No. 123, Fig. C)

By W. C. Robinson

LOCATION: Lat. 48° 48.1' Long. 123° 11' (92B/14E)
At the north end of Saturna Island; quarry, one-quarter mile east of the head of Winter Cove; plant, on the peninsula between Winter Cove and Lyall Harbour.

OWNER: BRITISH COLUMBIA LIGHTWEIGHT AGGREGATES LTD., 855 West Broadway, Vancouver 9.

DESCRIPTION: Upper Cretaceous Nanaimo Group shale is quarried and processed to produce lightweight aggregate and pozzolan clinker.

WORK DONE: Renewal of the barge-loading facilities was completed during 1972. Other work included the preparation of a new quarry site closer to the plant area. Drilling and blasting was carried out by a contractor on two occasions during 1972 to produce 35,000 cubic yards of shale. Two men were employed at the quarry throughout the year. Shale was processed at the plant to produce 84,283 cubic yards of expanded shale aggregate.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 459.

DUNSMUIR SHALE PIT (No. 131, Fig. C)

By W. C. Robinson

LOCATION: Lat. 49° 11.8′ Long. 124° 05.5′ (92F/1E)
At 900 feet elevation, in the northeast part of Block 226, Dunsmuir Land District, adjoining Weigles (Black Jack, Dumont) road on the north, 2 miles south and west of the powerline at Brannen Lake.

ACCESS: By Weigles road from Highway 19.

OWNER: Canada Cement Lafarge Ltd.

OPERATOR: BUTLER-LAFARGE LTD., Box 435, Nanaimo.

WORK DONE: Shale produced for use in cement manufacture, 64,724 tons. A crew averaging four men was employed.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 460.

RICHMIX QUARRY (No. 140, Fig. C)

By J. W. Robinson

LOCATION: Lat. 49° 03.5′ Long. 122° 11.7′ (92G/1E)
Adjoins Kilgard on the northeast.

OWNER: MUTUAL MATERIALS LIMITED, 2890 East Kent Avenue, Vancouver 16.

WORK DONE: Fireclay was quarried and trucked to the plant in Vancouver, where firebrick was manufactured.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 460.

CANADIAN REFRACTORIES LTD. (No. 141, Fig. C)

By J. W. Robinson

LOCATION: Lat. 49° 03.2′ Long. 122° 17.3′ (92G/1W)
49° 03.5′ 122° 11.7′ (92G/1E)
Plant at Abbotsford; mine and quarries at Kilgard.

OWNER: DRESSER INDUSTRIES CANADA LTD. (Canadian Refractories Division), Box 160, Abbotsford.

WORK DONE:

During 1972, 900 feet of drifts and 550 feet of crosscuts were driven in the Fireclay mine at Kilgard. Fireclay produced from the underground mine at Kilgard was 19,994 tons. Clay produced from the Kilgard No. 9 and the Straiton pits was 60,506 tons.

New open-pit development in 1972 consisted of stripping 10,000 tons of soil and 900 tons of sandstone.

The resident manager is B. T. Stephens. There were five employees working underground, four employees working in the open pit, and one supervisor for a total of 10 employees at the year end.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 460.

HANEY BRICK AND TILE LIMITED (No. 142, Fig. C)

By J. W. Robinson

LOCATION: Lat. 49° 12.6′ Long. 122° 35.9′ (92G/2E)
On the north bank of Fraser River, at the east edge of Haney.

OWNER: HANEY BRICK AND TILE LIMITED, Box 38, Maple Ridge.

WORK DONE:

During the year 6,767 tons of clay quarried adjacent to the plant was manufactured into hollow clay drain tile, structural tile, facebrick, common brick, flue lining, and flower pots. Approximately 90 per cent of the production is hollow clay drain tile.

A 3-ton overhead crane was added in the shop. The resident manager is A. G. Findlay. At year end there were 18 employees on the payroll.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 461.

DAVE, SIL (No. 146, Fig. C)

LOCATION: Lat. 51° 02'-08' Long. 121° 45'-52' (92P/4W)
Along the east side of Porcupine Creek, 12 miles due west of Clinton.

CLAIMS: DAVE, SIL, ROAD, PCR, TS, TWO MILE, etc., totalling approximately 120.

ACCESS: By tote road one-quarter mile from Jesmond road or by foot approximately one-half mile from Kelly Lake road.

OWNER: Columbia Lime Corporation Ltd.

OPERATOR: COLUMBIA LIME PRODUCTS LTD., 535 Airport Road South, Vancouver International Airport, Richmond.

DESCRIPTION: A large body of shale containing about 75 per cent silica, 6 per cent iron, and 6 per cent alumina is being tested for possible use in cement manufacture.

WORK DONE: Twelve samples analysed; 1 mile of road constructed (southwest of Porcupine Creek).

DIATOMITE

CROWNITE INDUSTRIAL MINERALS LTD. (No. 143, Fig. D)

By A. D. Tidsbury

LOCATION: Lat. 52° 57.6' Long. 122° 32.2' (93B/15E)
Processing plant at the south end of the old bridge over Quesnel River at its confluence with the Fraser; red shale quarry on Lot 222, adjacent to the plant; diatomite quarry on Lot 906, 1.5 miles southwest of Quesnel.

ACCESS: By road from Quesnel.

OWNER: CROWNITE INDUSTRIAL MINERALS LTD., 706 Seventh Avenue SW., Calgary, Alta; quarry address, Box 1870, Quesnel.

WORK DONE:

Overburden is removed from the diatomite by a 627 scraper. Mining from 10-foot-high benches, 1,000 feet long, is by front-end loader into a 20-ton Renn Trailer Unit for transportation to plant or stockpile. Red shale is mined and similarly loaded for stockpiling or processing.

In 1972, the nominal 100-ton-per-day plant operated at various rates over a five-month period. A total of 6,123 tons of diatomite and red shale was crushed, dried in rotary dryers, and screened into coarse aggregate and fine products. Fines were further ground and beneficiated into various grades of red shale and diatomite powders.

Seventeen thousand tons of overburden was removed from the diatomite deposit.

During the balance of the year major circuit and system changes were implemented and are on-going.

Manpower varied from a high of 34 to a low of eight.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 461.

DOLOMITE

DOLO (No. 190, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 01.3′ Long. 118° 57.9′ (82E/2W)
At 3,400 feet elevation south of Myers Creek, near the southeast of Lot 446s, 3.5 miles southeast of Rock Creek settlement.

ACCESS: Via public and private roads from Rock Creek.

OWNER: NEW DOLOMITE WHITE MINING LIMITED, Box 66, Kelowna.

DESCRIPTION: Dolomite forms the crest of a low mountain south of Rock Creek and immediately north of the United States border.

WORK DONE: About 10,000 tons of dolomite was mined and hauled to the company crushing, screening, and bagging plant about 1 mile south of Westbridge. Bagged material was either stockpiled or shipped to markets in Vancouver.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 456.

CRAWFORD CREEK DOLOMITE QUARRY (No. 193, Fig. A)

By P. E. Olson

LOCATION: Lat. 49° 41.5′ Long. 116° 46.5′ (82F/10W)
Main workings are on the southeast side of Crawford Creek, about 1.5 miles from Crawford Bay on Kootenay Lake.

ACCESS: The quarry is on a good highway which leaves the Crawford Bay-Creston Highway about 1 mile south of Crawford Bay Post Office.

OWNER: INTERNATIONAL MARBLE & STONE COMPANY LTD., 4030 Seventh Street SW., Calgary, Alta.

WORK DONE: Underground workings have been expanded with production amounting to about 50,000 tons. Underground mining is more expensive than ordinary quarrying but the final product is much cleaner and hence commands a better price.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 457.

FLUORITE

ROK, CAT (No. 13, Fig. A)

LOCATION: Lat. 49° 13.5′ Long. 114° 41.5′ (82G/2E)
Report on this property under metals in section 82G/2E.

TO (No. 34, Fig. A)

LOCATION: Lat. 50° 49.2′ Long. 119° 40.5′ (82L/13E)
KAMLOOPS M.D. On the south side of the Trans-Canada Highway at Chase, on the south shore of Little Shuswap Lake.
CLAIMS: TO 1 to 6.
ACCESS: By the Trans-Canada Highway.
OWNER: TEMPO RESOURCES LTD., 207, 536 Eighth Avenue SW., Calgary, Alta.
DESCRIPTION: Fluorite is associated with fractures in andesites and syenites.
WORK DONE: Geological mapping, 1 inch equals 50 feet during 1971.
REFERENCE: Assessment Report 3915.

REXSPAR (No. 122, Fig. A)

LOCATION: Lat. 51° 33′ Long. 119° 55′ (82M/12W)
Report on this property under metals in section 82M/12W.

DEER (No. 32, Fig. D)

LOCATION: Lat. 54° 23.7′ Long. 126° 34′ (93L/7E)
Report on this property under metals in section 93L/7E.

FLUORITE-WITHERITE OCCURRENCES NEAR LIARD RIVER HOT SPRINGS PARK

By J. W. McCammon

INTRODUCTION: An interesting area of fluorine-barium mineralization occurs north of Liard River Hot Springs Park at Mile 497 on the Alaska Highway in northern British Columbia. Fluorite is found with witherite, barite, and barytocalcite along an argillite-limestone contact near the crest and around the nose of a south-plunging anticline. Rock exposures are only fair but mineralized outcrop has been reported at intervals from the park boundary at about latitude 59 degrees 26.3 minutes and longitude 126 degrees 5 minutes north to latitude 59 degrees 35.5 minutes. Other barite and fluorite occurrences are known in correlative rocks for 70 miles or more to the southeast, particularly near Muncho Lake and MacDonald Creek. Undoubtedly more are present and will be found by detailed mapping and prospecting.

HISTORY: Discovery of fluorite and witherite near the hot springs was first reported in the summer of 1953. The next year Conwest Exploration Company Limited obtained control of the main area of the original claims called the Gem property. The company built a road to the showings from Mile 498 on the Alaska Highway, carried out geological mapping and some stripping, and shipped a bulk sample for metallurgical testing. Later the company diamond drilled a few short holes. In the summer and autumn of 1971 interest was renewed in the area, and J. R. Woodcock and others located about 900 claims over geologically favourable ground. Late in 1971 and in 1972 Jorex Limited joined with Conwest Exploration Company Limited and J. R. Woodcock Consultants

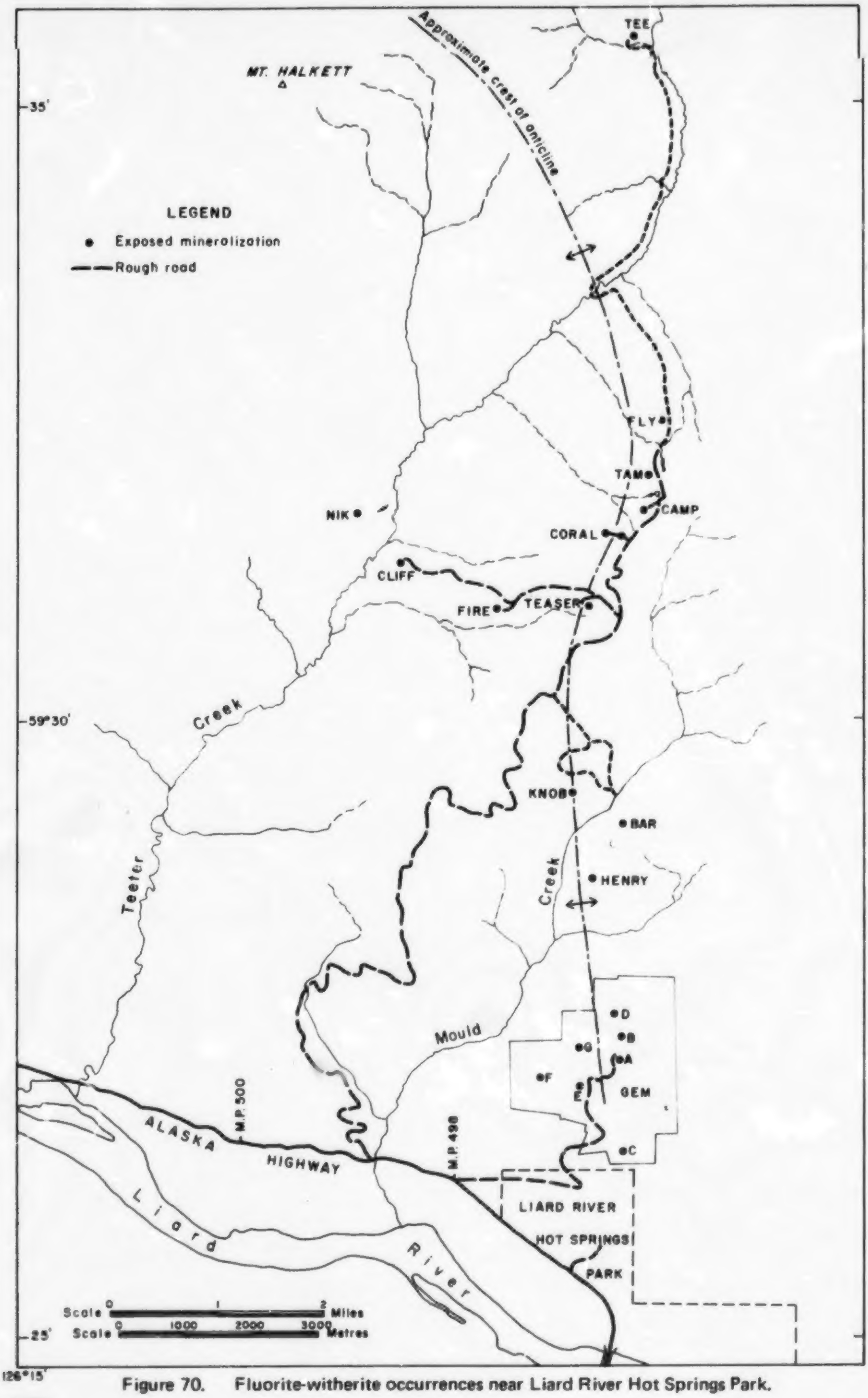

MT. HALKETT
Approximate crest of anticline
LEGEND
● Exposed mineralization
Rough road
TEE
35'
FLY
TAM
CAMP
CORAL
NIK
CLIFF
FIRE
TEASER
59°30'
Creek
Teeter
KNOB
BAR
HENRY
Creek
Mould
D
B
G
A
F
E
GEM
C
M.P. 500
ALASKA
HIGHWAY
M.P. 498
LIARD RIVER
HOT SPRINGS
PARK
Liard
River
Scale 0 1 2 Miles
Scale 0 1000 2000 3000 Metres
25'
126°15'

Figure 70. Fluorite-witherite occurrences near Liard River Hot Springs Park.

Ltd. in an exploration programme that involved areal prospecting, geological mapping, and diamond drilling and trenching on specific showings, particularly the Gem, Cliff, Fire, Teaser, Coral, Camp, Tam, and Tee.

The writer spent three days at the showings in August 1972. Provision by Conwest Exploration Company of accommodation, access to maps, records, and drill core, and assistance of resident personnel, particularly Mr. Scott Zimmer, is gratefully acknowledged.

PHYSICAL SETTING: The area lies at the south end of the Liard Plateau. Although not rugged, the terrain is dissected by numerous multidirectional gullies and stream valleys. Mould Creek traverses the central part of the region and Teeter Creek flows down the west margin. Elevations range from 1,400 feet along the Liard River to about 4,000 feet. A former dense forest cover was largely burned by a major fire that swept through the region in the summer of 1971.

Access to the Gem showings is by a road that extends eastward and then northward from Milepost 498 on the Alaska Highway. Access to the other showings is by a rough and, in places, very steep road that extends northward from the highway just west of Mould Creek.

PETROLOGY: The rocks in the area belong to the Middle Devonian Dunedin Formation and the Middle Devonian to Mississippian Besa River Formation (reference 2). The former consists of fine-grained, commonly fossiliferous, light and dark grey and black limestone. All that was tested effervesced vigorously with dilute hydrochloric acid. It gives off a strong fetid odour when struck. The overlying Besa River Formation consists mainly of hard black thin-bedded argillite. In most places it is blocky but may be slaty or sometimes shaly. In one outcrop on the Fire showing the argillite contains a high concentration of magnetite. In one or two places small amounts of grey siltstone were noted at the limestone contact.

STRUCTURE: The argillite in this area has been described as overlying the limestone disconformably (references 1, 3, 5, and 6). In exposures observed by the writer, mineralized patches, breccia, and minor folds distort and obscure the true bedding relationships. Elsewhere the contact is said to be conformable (reference 4). The rocks are folded into a major anticline that plunges gently southward. Most observed bedding dips are low. No major faults were recognized in the immediate vicinity of the showings.

MINERALIZATION: The mineralization located to date consists of irregular lenses scattered along the contact between the limestone and argillite. The mineralizing process has involved replacing rock, filling spaces between rock fragments in breccia, and some minor forming of veins. The bulk of the mineralized material appears to be either in limestone or in space that was probably formerly occupied by limestone.

The breccia may consist of limestone, argillite, mineral, or mixed fragments in a matrix of fluorite and/or one or more of the barium minerals. Fragments are mostly angular and no more than a few inches in diameter but may be larger. The amount of brecciation varies greatly in different exposures. The breccia is commonly mostly within the limestone but may occur in the overlying argillite.

The main minerals of interest that have been identified are fluorite, witherite, barite, and barytocalcite. Quartz is present in some outcrops but is seldom plentiful, and coarse-grained calcite may occur. The fluorite may be fine grained and black, or coarse grained and various shades of mauve through purple to black, or rarely light green. The coloured varieties tend to become pale through bleaching when exposed to the sun and weather. The fine-grained black fluorite generally has a granular appearance as though it were composed of one-half-millimetre rounded grains packed together and held by sparse, usually carbonate, cement. Where tested, the black colouration was found to be due to fine-grained carbon. The barium minerals are grey to white and generally fine but may be coarse. Witherite is most abundant; barite and barytocalcite occur scattered in much smaller quantities. Where recognized, the barytocalcite was in coarse-grained masses in witherite. One specimen of very coarse-grained barytocalcite was obtained in 1962 from the core of a hole drilled in the centre of the road to the Gem showings about 1.75 miles from the highway. This specimen was from a 10-foot-thick vein in black limestone which was intersected about 45 feet below ground surface.

There appear to have been several stages of mineralization. A detailed study of the paragenesis was not maue but an approximate sequence as follows was noted. The first mineral deposited was fine-grained black fluorite accompanied or soon followed by witherite. This material was then brecciated and recemented with coarse-grained mauve to purple fluorite and witherite. More brecciation took place locally, followed by recementation with witherite, coarse-grained purple fluorite, and finally some barite. All stages need not necessarily have taken place at any given locality.

This mineralized area resembles other fluorite deposits that occur in carbonate rocks under impervious cappings in that associated brecciation appears due to compaction following shrinkage due to replacement of the host rock by fluorite (reference 7).

REFERENCES: (1) *Minister of Mines, B.C.*, Ann. Rept., 1954, pp. 178, 179; (2) Gabrielse, H., personal communication; (3) Gabrielse, H., *Geol. Surv., Canada*, Map 46-1962, Rabbit River; (4) Taylor, G. C. and MacKenzie, W. S., Devonian Stratigraphy of Northeastern British Columbia, *Geol. Surv., Canada*, Bull. 186, p. 16; (5) Woodcock, J. R. and Smitheringale, W. V., Fluorite-Witherite Deposit at Lower Liard Crossing, British Columbia, The Geology of Canadian Industrial Mineral Deposits, *Sixth Commonwealth Mining and Metallurgical Congress*, 1957, pp. 244-247; (6) Assessment Reports 109, 3840, 3975; (7) Peters, W. C., *Ec. Geol.*, Vol. 53, 1958, pp. 663-688.

Exploration work has been done on mineral showings designated as the Gem, Cliff, Fire, Teaser, Coral, Camp, Tam, and Tee. Brief descriptions of these, except for the Tee, follow.

GEM (No. 46, Fig. E)

LOCATION: Lat. 59° 27' Long. 126° 06' (94M/8E)
LIARD M.D.

DESCRIPTION:

In 1960, seven main mineralized outcrops were examined at A, B, C, D, E, F, and G on the Gem showings. The following descriptions are based on that examination.

At A, a 30 to 50-foot-high ridge-like mesa about 50 feet wide extends for 350 feet northwesterly. Rock is well exposed on its sides and north end. The ridge is capped by slaty argillite that strikes north 30 degrees east, dips 12 degrees southeast, and overlies dark grey fine-grained limestone. Mineralization is exposed at the contact along part of each side and around the north end of the ridge. The mineralized material consists both of limestone replaced by purple to black fluorite mixed with witherite, and brecciated limestone and argillite cemented by the same minerals. The zone pinches and swells, with thickness ranging between zero and 20 feet. A chip channel sample collected down the slope for 30 feet perpendicular to the contact at the widest exposure at the northeast corner of the ridge had the following percentage composition: Ca = 22.92, F = 18.62, Ba = 16.93, CO_2 = 10.04, SO_3 = 2.03, SiO_2 = 3.56. Spectrographic analysis indicated the presence of more than 1 per cent of strontium in the sample.

Exposures were poor at locality B but showed fluorite-witherite mineralization in four places scattered along about 400 feet of argillite-limestone contact revealed around the west side of a low hillock. The visible thickness of the mineralized zone was 5 to 13 feet. A sample cut on the west end of the nose across 13 feet had the following percentage composition: Ca = 15.91, F = 14.21, Ba = 40.68, CO_2 = 13.32, SO_3 = 2.14, SiO_2 = 0.66. A spectrographic analysis again indicated more than 1 per cent strontium present.

Two small showings of typical mineralization were seen in a short trench and pit at C.

Exposures were poor at D. Three mineralized patches were found within an area about 400 feet long and 150 feet wide. Witherite was the most abundant mineral present.

At E a bulldozer had been used to open a 5 to 10-foot-wide trench for 250 feet southwestward down a 10-degree slope. Irregularly mineralized rock mostly calcareous, and containing fluorite and witherite, was visible in the upper 200 feet of the trench. Little outcrop occurs adjacent to the trench. About 140 feet southwest of the south end of the trench a second shallow cut and four small pits exposed more similar mineralized rock. A sample collected up the top 200 feet of the main trench contained, in percentage, the following: CaO = 18.27, F = 13.83, Ba = 19.34, CO_2 = 9.60, SO_3 = 2.37, SiO_2 = 14.04. A spectrographic analysis showed a content of more than 3 per cent strontium. New vertical drilling at this showing in 1972 yielded cores containing up to 39 per cent fluorite over 40 feet.

An open, grassy, and partly rock-strewn slope with poor bedrock exposures was found at F. Limestone containing fluorite and witherite was visible in one area about 35 feet by 60 feet. A similar patch about 30 feet long by 50 feet is 250 feet to the southwest, and a third small area is 50 feet to the southeast.

An area 30 feet wide and 80 feet long containing mineralization, predominantly witherite, in limestone was seen at G. The exposure was on the west slope of a 35-foot-high ridge.

Halfway between E and G, more witherite with some fluorite was exposed in limestone at the contact with overlying argillite. This was on the east side of a 30-foot-high ridge.

CLIFF (No. 47, Fig. E)

LOCATION: Lat. 59° 31.3' Long. 126° 08.9' (94M/9E)
LIARD M.D.

DESCRIPTION:

At the Cliff showing the usual type of mineralization can be traced for nearly 400 feet along a bluff that rises from south to north. Most of the bluff is limestone overlain toward the south by siltstone-argillite breccia. The bulk of the mineral is in the breccia. Toward the north, quartz and scattered pods of very coarse-grained calcite are present in the limestone.

FIRE (No. 48, Fig. E)

LOCATION: Lat. 59° 30.9' Long. 126° 07.3' (94M/9E)
LIARD M.D.

DESCRIPTION:

The Fire deposit is on a clean-burned gentle southwest slope. Outcrops and trenches are shown on Figure 71 which is a slightly modified version of a company map.

The geological setting at this occurrence is similar to those already described. The rocks strike northwestward and dip gently southwestward. There is some indication that the dip of the overlying argillite is slightly smaller than that of the limestone. In places the argillite displays minor folds not recognized in the more massive limestone. Such folds can be seen in the stripped area near the southwest corner of the map and in a trench (not shown) about 700 feet to northwest of the latter spot.

Mineralization visible on the surface is concentrated mainly in argillite breccia and on the whole is not spectacular. The best observed is 100 feet south of diamond-drill hole 30, 150 feet northwest of diamond-drill hole 30, and in the bluff northwest of diamond-drill hole 20. South of hole 30 fluorite and witherite form the matrix in argillite breccia and also form veinlets and thin sills in unbrecciated argillite. Little mineral was noticed in the underlying limestone. In the east-west trench north of hole 30 weak barite mineralization is present in the matrix of the breccia toward the east end, whereas at the west end there is a good display of light purple fluorite. The core of vertical hole 30 showed casing from 0 to 11 feet; sparse fluorite, quartz, and witherite in argillite breccia from 11 to 23.5 feet; and brecciated limestone with some calcite veins to the end of the hole at 38 feet. In a bluff 100 feet southeast of hole 20 argillite breccia is cemented with vuggy white quartz containing sparse white fluorite. The argillite contains a noticeable amount of disseminated magnetite. The bluff across the road northwest of hole 20 consists of mineralized argillite breccia containing black and purple fluorite, barite, minor clay and limonite, and considerable loose carbon. Many vugs are present and some contain small well-formed tabular barite crystals. Hole 20, drilled vertically, showed overburden from 0 to 5 feet, well-mineralized argillite breccia from 5 to 22 feet, and massive dark limestone with little mineralization from 22 feet to the end of the hole at 38 feet. The brecciated argillite in the trench 400 feet west of diamond-drill hole 20 showed scanty mineralization of witherite with minor fluorite and some quartz. Other areas showed only weak mineralization. Core from vertical hole 37 consisted of lightly mineralized argillite and argillite breccia to 84 feet, then slightly mineralized limestone breccia to 217 feet, and barren limestone to the bottom of the hole at 234 feet. An interesting feature was a 6-inch layer of spongy limonitic material at the 92-foot mark.

TEASER (No. 49, Fig. E)

LOCATION: Lat. 59° 30.9' Long. 126° 05.9' (94M/9E)
LIARD M.D.

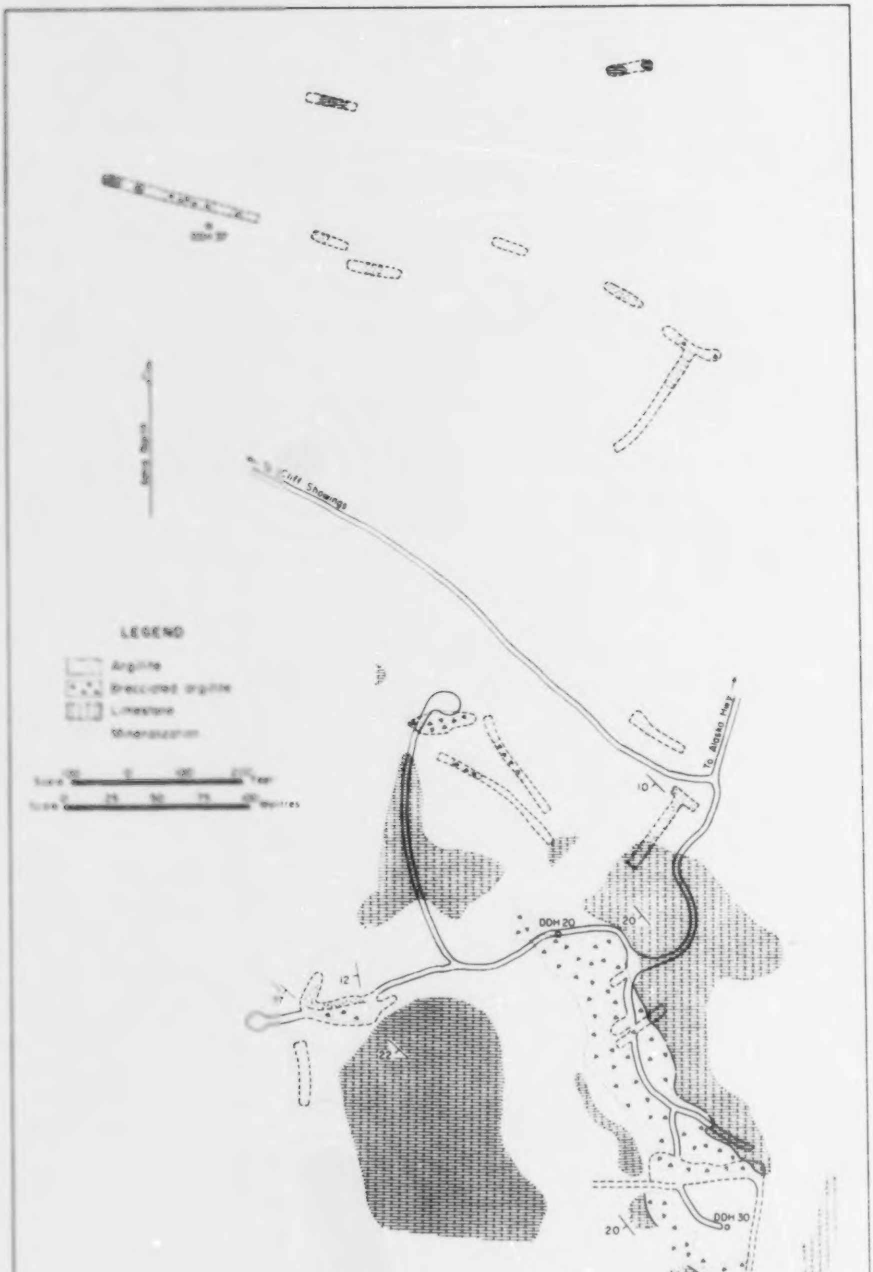

LEGEND
Argillite
Brecciated argillite
Limestone
Mineralization
Scale 100 0 100 200 Feet
Scale 0 25 50 75 100 Metres
To Cliff Showings
To Alaska Hwy
10
20
DDH 20
12
22
20
DDH 30

Figure 71. Geology of the Fire showing.

DESCRIPTION:

This showing, like the Fire, is on a clean-burned southwest slope. Witherite, some barytocalcite, and scarce fluorite occur with coarse calcite in small scattered patches in limestone, limestone breccia, and argillite breccia in an area about 600 feet square. Argillite is predominant in the eastern part of the area with limestone in the west. A road-trench extends along the north side, down the west side, and across the bottom of the area. A considerable area of stripped and natural outcrop is exposed in the western section. One outstanding feature at this deposit is the presence of a large mass of yellow and brown limonitic gossan in the northwest corner. A spectrographic analysis of a sample of the gossan showed the following estimated percentage composition: $Si > 10$, $Fe > 25$, $Al = 0.2$, $Cu = 0.02$, $V = 0.1$, and traces of Ag, Ca, Cr, Mg, Mn, Mo, Na, Ni, Sr, Ti, W, Zn, Zr.

CORAL (No. 50, Fig. E)

LOCATION: Lat. 59° 31.5' Long. 126° 05.4' (94M/9E)
LIARD M.D.

DESCRIPTION:

Two areas have been explored at the Coral showing. One is about 600 feet long and 600 feet wide and the other, 300 feet to the west, is 300 feet wide and 350 feet long. The ground slopes gently south, is largely timber and brush covered, and has few natural rock exposures. Bedrock examined was almost completely in the trenches, roads, and stripped zones which total approximately 1,400 lineal feet in each area. Several holes have been diamond drilled.

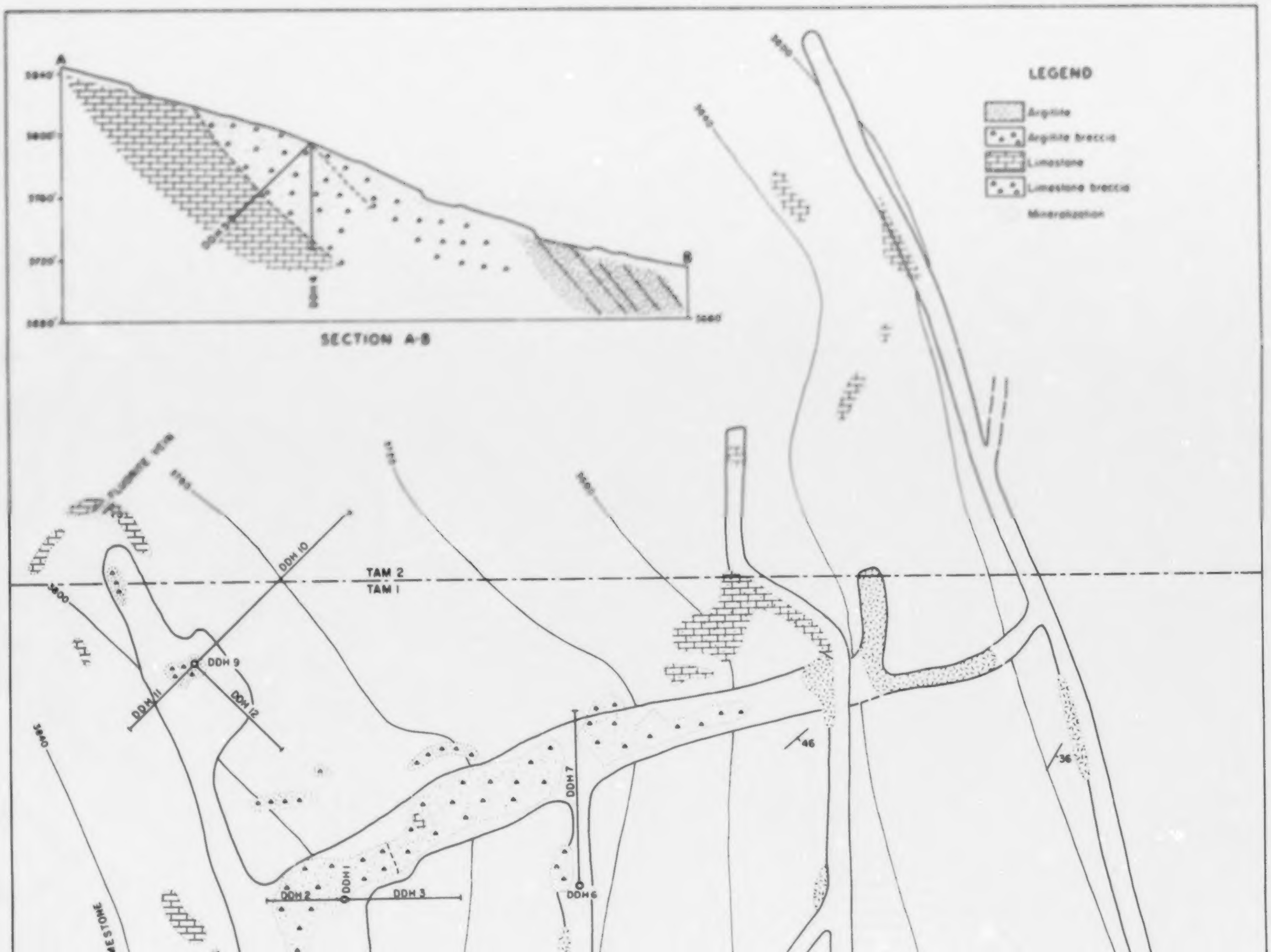
Geologically, the setting at the Coral is typical of the region. The rocks strike westward and dip between 15 and 20 degrees southward. Limestone occurs in the north and argillite in the south. Most of the mineralization is along the contact in argillite or limestone breccia. Fluorite and witherite, with minor barite and barytocalcite, occur in irregular patches and variable proportions in the visible exposures. Minor quartz, thought possibly to consist of remnant grains from a thin siliceous siltstone bed, was noted in some thin sections. Consecutive channel samples 10 feet long, taken by the company along 110 feet in the main eastern stripped zone, contained from 8 to 88 per cent fluorite, most being in the 40 to 80 per cent range. These samples were cut nearly parallel to the strike of the rocks. Diamond drilling has shown that the mineralization exposed at the surface extends southward under the argillite cover.

CAMP (No. 51, Fig. E)

LOCATION: Lat. 59° 31.7' Long. 126° 05' (94M/9E)
LIARD M.D.

DESCRIPTION:

At the Camp prospect about 2,000 lineal feet of trenching and stripping has been done in an area 800 feet square on the top and upper part of the north slope of a low hill. The ground was mostly burned over in 1971. It shows little natural outcrop. Mineralization was examined in two shallow stripped areas near the centre of the prospect. In the largest,


LEGEND
Argillite
Argillite breccia
Limestone
Limestone breccia
Mineralization
SECTION A-B
A
B
3840'
3800'
3760'
3720'
3680'
DDH 9
DDH 10
DDH 11
DDH 12
DDH 1
DDH 2
DDH 3
DDH 6
DDH 7
TAM 2
TAM 1
Fluorite vein
3840
3800
3760
3720
3680
36
46
MESTONE

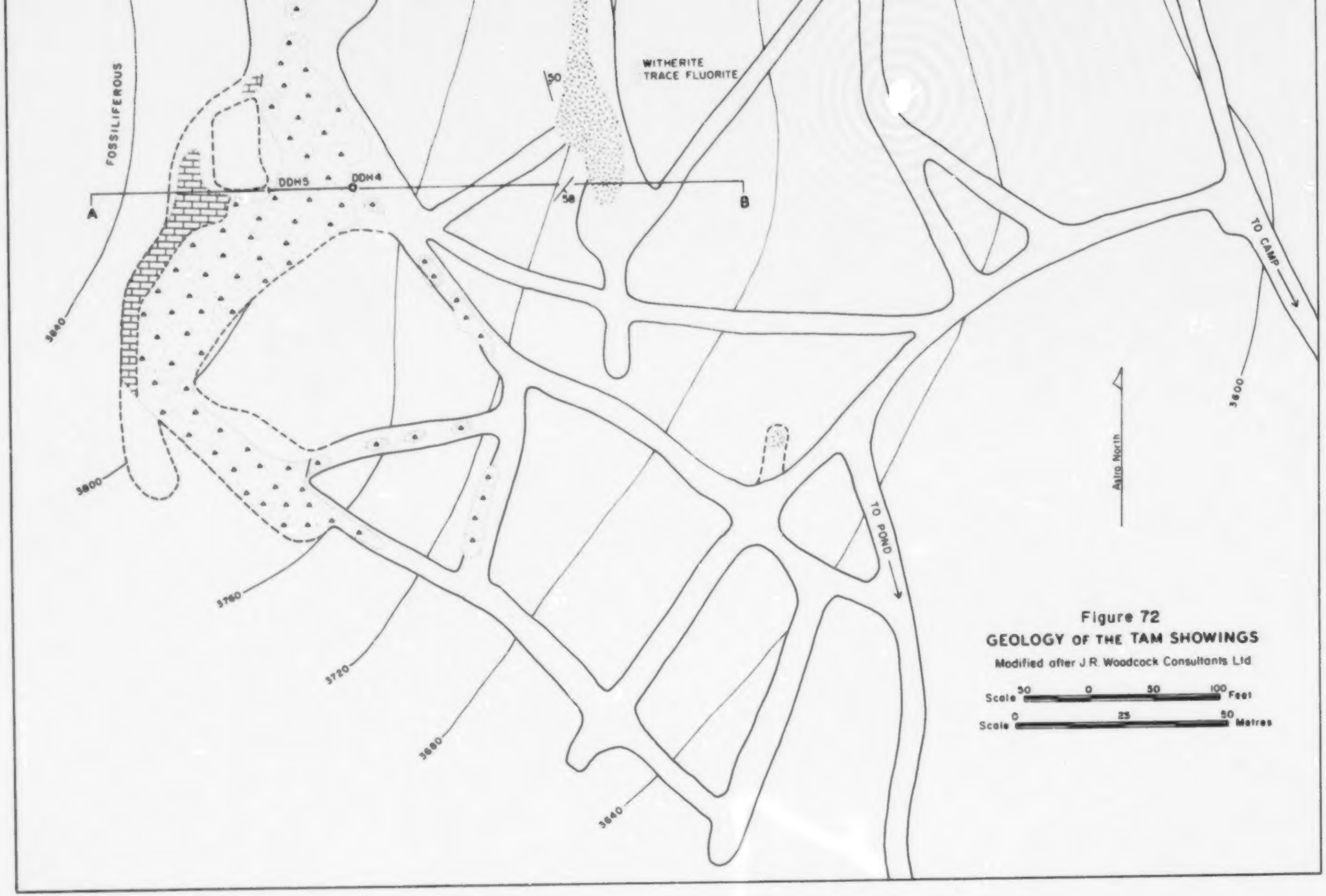


Figure 72

GEOLOGY OF THE TAM SHOWINGS

Modified after J.R. Woodcock Consultants Ltd

WITHERITE
TRACE FLUORITE
FOSSILIFEROUS
DDH5
DDH4
A
B
50
58
TO CAMP
TO POND
Astro North
3600
3640
3680
3720
3760
3800
3840
Scale 50 0 50 100 Feet
Scale 0 25 50 Metres

argillite that strikes north 30 degrees east and dips 25 degrees southeast overlies dark limestone on the east. The contact crosses the stripped area on the north edge at the top end of a trench that extends 300 feet northwest down the slope. Both limestone and argillite are brecciated at the contact. The mineralization seen consisted of fluorite and witherite with some barite. It could be recognized scattered for about 70 feet in argillite breccia southeast of the contact and for nearly 200 feet in limestone breccia and limestone northwest of the contact. The mineralization appears patchy and, in general, quite mixed. In the second area, 150 feet to the northeast, mineralization was poorly exposed for 45 feet in limestone. None of the other trenches showed any recognizable interesting mineralization.

TAM (No. 51, Fig. E)

LOCATION: Lat. 59° 32′ Long. 126° 04.9′ (94M/9E)
LIARD M.D.

DESCRIPTION:

The Tam showing is on the lower part of the slope at the southeast end of a short elongate hill. Little vegetation remains near the workings but few natural outcrops are visible except higher up the hill. The distribution of the workings and exposures are shown on Figure 72 which is slightly modified from a company plan.

The geological setting is similar to that of the other showings. Thin-bedded siliceous black argillite that strikes northeast and dips an average of 45 degrees southeast overlies rather massive grey fine-grained fossiliferous limestone. Along the contact there may or may not be brecciation of limestone or argillite or both. Local minor folds or rolls in the bedding are present in the argillite as shown by the exposure near the centre of the workings. The irregular westerly protrusion of argillite breccia in the north central part of the showing may be due to a synclinal fold, or alternatively to a southwesterly striking fault.

Mineralization is present chiefly in limestone or argillite breccia and sometimes is so abundant that the original rock is difficult to recognize. The highest grade mineralization appears to be in limestone breccia. The fluorite is either fine grained and black or coarse and some shade of purple. At the northwest corner a 16-foot-wide vein contains light green to white fluorite and coarse white calcite. A 2.5-foot-wide horse of limestone is enclosed in the centre of the vein. The most abundant barium mineral is witherite with lesser barite and barytocalcite. Small vugs are scattered through the mineralized matter. On the surface at diamond-drill hole 1, pumice-like boxwork patches are conspicuous. Company assay results for CaF_2 content in some drill cores (all vertical holes) were as follow: hole 1, 0 to 89 feet = 48 per cent, 90 to 153.6 feet = 16 per cent; hole 4, 10 to 50 feet = 53 per cent, 50 to 87 feet = 26 per cent; hole 6, 6 to 76 feet = 9 per cent; hole 9, 0 to 110 feet = 25 per cent, 110 to 147 feet = 13 per cent (this hole hit limestone at 60 feet). At the time of examination diamond drilling was in progress.

SNOW (No. 40, Fig. E)

LOCATION: Lat. 59° 04.6′ Long. 125° 39′ (94N/4E)
LIARD M.D. Near the north end of Muncho Lake, 5 miles east-northeast of Mile 465, Alaska Highway.

CLAIMS: SNOW 1, 2, 5, 6, 8, 15, 18, 30, 31.

ACCESS: By helicopter from the Alaska Highway.

OWNER: CONWEST EXPLORATION COMPANY LIMITED, 1001, 85 Richmond Street West, Toronto, Ont.

WORK DONE: Geological mapping, 1 inch equals 50 feet on all claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 462; Assessment Report 3965.

BOW, DAN (Nos. 45 and 69, Fig. E)

LOCATION: BOW, PETE, RAE (No. 45)
Lat. 59° 52'-57' Long. 125° 26'-30' (94N/13E, 14W)
DAN, JOY, STAN, SUN, TOM (No. 69)
Lat. 59° 41'-45' Long. 125° 28'-34' (94N/11W, 12E)
LIARD M.D. North of the Grayling River and west of the head of Scatter Creek and west of Crow River, between elevations of 3,500 and 5,000 feet.

CLAIMS: BOW, PETE, RAE, totalling 139; DAN, JOY, STAN, SUN, TOM, totalling 156.

ACCESS: Thirty to 40 miles by helicopter northeast of Mile 496 on the Alaska Highway.

OWNERS: Pan Ocean Oil Ltd. and Bow Valley Industries.

OPERATOR: PAN OCEAN OIL LTD., 1050 Three Calgary Place, 355 Fourth Avenue SW., Calgary, Alta.

DESCRIPTION: Bedded or blanket bodies of fluorite occur along or below the unconformity between Besa River shale and the underlying Dunedin limestone. Fluorite may also be associated with fracture zones or breccia zones in the carbonate rocks.

WORK DONE: Prospecting and geological mapping were done on the Bow and Dan claims and 467 samples were collected on the Bow claims for geochemical analysis.

GYPSUM

WESTERN GYPSUM LIMITED (No. 146, Fig. A) By R. W. Lewis

LOCATION: Lat. 50° 30' Long. 115° 54' (82J/5W, 12W)
GOLDEN M.D. The quarry is between 4,000 and 5,000 feet elevation on the north side of Windermere Creek, 8 miles east of Windermere. The secondary crushing and shipping plant is at Wilmer.

CLAIMS: The coany holds 41 Crown-granted claims.

ACCESS: By private paved road from Wilmer, 11 miles.

OWNER: WESTERN GYPSUM LIMITED, 2650 Lakeshore Highway, Clarkson, Ont.; quarry address, Box 217, Invermere.

WORK DONE:

Gypsum is mined, crushed in a primary crusher located about 250 feet from the quarry

ACCESS: About 50 miles by road from Lillooet.

OWNER: GREEN BAY EXPLORATION AND MINING CO. LTD., Box 36, Chilliwack.

DESCRIPTION: Nephrite occurs *in situ* in shear zones in serpentinized peridotite.

WORK DONE: An area of about 6,000 to 8,000 square feet was trenched and stripped on Mineral Lease M-51 (Blue 1 and 2 claims) and about 800 lineal feet of percussion drilling was done.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 463; Assessment Reports 4360, 4361, 4362 (4-Ton).

4-TON (MARSHALL CREEK) (No. 175, Fig. C)

LOCATION: Lat. 50° 54.7′ Long. 122° 30.1′ (92J/15E, 16W)
LILLOOET M.D. At elevations between 3,500 and 4,000 feet on the northeast side of Marshall Creek.

CLAIMS: 4-TON, ROYAL, LANG, JIM, etc., totalling about 125.

ACCESS: By road, 50 miles from Lillooet.

OWNERS: International Jade Ltd. and Comaplex Resources International Ltd.

OPERATOR: COMAPLEX RESOURCES INTERNATIONAL LTD., 605, 444 Seventh Avenue SW., Calgary, Alta.

DESCRIPTION: Nephrite occurs *in situ* as lenticular pods in elongated bodies of serpentinite.

WORK DONE: A topographic map of the claims was made, detailed geological mapping was done on the 4-Ton, Lang 6 and 9 claims, also a seismic survey along an 800-foot line, magnetometer survey along 18 miles of line, and induced polarization survey along 2,500 feet of line.

REFERENCES: Assessment Reports 4360, 4361, 4362.

BIRKENHEAD (No. 158, Fig. C)

LOCATION: Lat. 50° 50′ Long. 122° 17′ (92J/16W)
LILLOOET M.D. Elevation 7,500 feet at the head of Hell and La Rochelle Creeks, 10 miles north of Seton Portage.

CLAIMS: BIRKENHEAD 1 to 16.

ACCESS: Seventeen miles by truck road from the Yalakom River road.

OWNER: Birkenhead Jade Mines Ltd.

OPERATOR: B.C. GEM SUPPLY LTD., 426 Homer Street, Vancouver 3.

WORK DONE: An area 100 by 2,000 feet on the Birkenhead 3, 4, 5, and 6 claims was stripped.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 464.

GREEN GOLD (No. 61, Fig. G)

LOCATION: Lat. 58° 47.5′ Long. 130° 05′ (104J/16E)
LIARD M.D. At elevations between 3,000 and 3,200 feet, 1 mile southeast of the north end of Dease Lake.

CLAIMS: GREEN GOLD 3 and 9, and Placer-mining Leases 757 and 804.

face, and conveyed overland by a series of belt conveyors to a truck-loading point on the valley floor. Three large capacity trucks then haul the gypsum to a stockpile at the secondary crushing, screening, and car-loading plant at Wilmer. The final product is shipped by rail for further processing at Calgary and Vancouver.

A total of 428,378 tons of gypsum was mined in the quarry, put through the primary crusher, and hauled by truck to the stockpile at Wilmer; 336,650 tons was treated at the secondary crushing and screening plant and then shipped to Vancouver and Calgary; 38,194 tons of gypsum fines was shipped from the fines stockpile during the summer months.

Modifications to the overland conveying system from the quarry to the truck-loading point enabled the quarry to operate on a trial basis during the winter months.

The company employed an average of 30 persons throughout 1972.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 462.

JADE (NEPHRITE)

Jade (nephrite) is known to occur *in situ* in serpentinite rocks and as boulders in alluvial deposits at a variety of localities in the Province.

The first jade mined was picked up by the Indians from bars along the Fraser and Bridge Rivers in the vicinity of Lillooet. Later jade was found on bars along the Fraser River as far downstream as Yale, on the Coquihalla River, and on the Bridge River as far as the junction of the Yalakom. Subsequently it was found on Hell, Marshall, and Noel Creeks, also on Kwanika, O'Ne-el, and Ogden Creeks and Mount Ogden in the Omineca; and in the north on Wheaton, Seywerd, and Thibert Creeks, on bars on the Liard River, at the Cassiar asbestos mine, and in serpentinite at the head of Blue River.

In 1972 production was reported by the following individuals and companies:

New World Jade Ltd., Mount Ogden
Birkenhead Jade Mines Ltd., Bridge River
Cassiar Lapidary, Cassiar
Far North Jade Ltd., Mount Ogden
International Jade Ltd., Marshall Creek
R. Purvis, Lillooet
Ben Seywerd, Seywerd Creek, Dease Lake
Mel Stewart, Ogden Creek

BLUE (GREENBAY) (No. 176, Fig. C)

LOCATION: Lat. 50° 54.7' Long. 122° 30.3' (92J/15E)
LILLOOET M.D. On the northeast side of Marshall Creek extending northwest from Brett Creek.

CLAIMS: GREENBAY, BLUE, JOHN, JIM, GB, totalling 32 and Mineral Lease M-51 (BLUE 1 and 2).

ACCESS: One-quarter to 1.5 miles by road from the Cassiar-Stewart Highway.
OWNER: BEN SEYWERD, 50526 Yale Road East, R.R. 1, Rosedale.
DESCRIPTION: Jade occurs in lenticular pods in serpentinite, and as alluvial boulders on Seywerd Creek.
WORK DONE: Two miles of road was built to provide access to the mineral claims and placer leases.

LIMESTONE

COBBLE HILL QUARRY (No. 122, Fig. C)

By W. C. Robinson

LOCATION: Lat. 48° 40.6' Long. 123° 37.4' (92B/12E)
At the southwest corner of Cobble Hill, 2 miles southwest of Cobble Hill Station.
OWNER: BRITISH COLUMBIA CEMENT COMPANY LIMITED, R.R. 1, Mill Bay.
WORK DONE: Limestone produced for use in Bamberton cement plant, 626,546 tons. A crew of 19 men was employed at the quarry.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 464.

MOUAT BAY (No. 90, Fig. C)

LOCATION: Lat. 49° 37.2' Long. 124° 23.5' (92F/9W)
Approximately 5 miles southeast of Gillies Bay, west side of Texada Island.
ACCESS: By dirt road south from Gillies Bay, approximately 6 miles.
OWNER: CANADA CEMENT LAFARGE LTD., 1051 Main Street, Vancouver 4.
DESCRIPTION: These claims are partly located over massive grey limestone.
WORK DONE: Surface diamond drilling, four holes totalling 521 feet on Paul 3, 23, 25, and 28.

IMPERIAL LIMESTONE QUARRY (No. 91, Fig. C)

By W. C. Robinson

LOCATION: Lat. 49° 44.4' Long. 124° 31.7' (92F/10E)
On the summit of the hill on Lot 500, three-quarters of a mile southwest of Spratt Bay on the north coast of Texada Island, 2 miles southeast of Vananda.
ACCESS: By road 2 miles southeast from Vananda.
OWNER: IMPERIAL LIMESTONE COMPANY LIMITED, 5427 Ohio Avenue South, Seattle, Wash. 98134.
WORK DONE: Quarry operated on Lot 500, stucco and whiting produced in plant at Vananda dock, whiting and coarse limestone produced at Spratt Bay. Limestone quarried during 1972, 150,000 tons; limestone shipped, 168,700 tons. An average crew of 19 men was employed.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 464.

IDEAL CEMENT QUARRY (No. 92, Fig. C)

By W. C. Robinson

LOCATION: Lat. 49° 42.9′ Long. 124° 33.8′ (92F/10E)
On Lot 25, Texada Island, about 2.5 miles south of Vananda.

ACCESS: South and west from Vananda by road, 0 to 4 miles.

OWNER: IDEAL CEMENT COMPANY (Rock Products Division), 610, 1200 West Pender Street, Vancouver 1.

WORK DONE: Three diamond-drill holes totalling 300.5 feet were drilled on the Ideal Fraction 20, and six holes totalling 632.5 feet were drilled on the Volunteer-Arbutus claims. Limestone quarried, 1,140,000 tons; limestone shipped, 1,130,375 tons. During the year construction of a new crushing, conveying, stockpiling, and barge-loading installation was started. A crew of 42 men was employed.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 465.

DOMTAR QUARRY (No. 134, Fig. C)

By W. C. Robinson

LOCATION: Lat. 49° 47.2′ Long. 124° 37.1′ (92F/15E)
At the north end of Texada Island on Lots 13, 17, 22, 23, 34 to 39, 271, 305, and 350.

ACCESS: By road, 1 mile from Blubber Bay.

OWNER: DOMTAR CHEMICALS LIMITED (Lime Division), 470 Granville Street, Vancouver 1.

WORK DONE: Limestone quarried, 796,800 tons; limestone shipped, 599,326 tons. A crew averaging 38 men was employed.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 465.

BEALE QUARRY (No. 135, Fig. C)

By W. C. Robinson

LOCATION: Lat. 49° 45′ Long. 124° 31.9′ (92F/15E)
On the north coast of Texada Island, 1 mile southeast of Vananda.

OWNER: CANADA CEMENT LAFARGE LTD. (Pacific Region), 1051 Main Street, Vancouver 4.

WORK DONE: Limestone quarried, 1,200,000 tons; limestone shipped, 953,868 tons. A crew averaging 24 men was employed.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 465.

FRASER VALLEY LIME (No. 249, Fig. B)

By J. W. Robinson

LOCATION: Lat. 49° 12′ Long. 121° 43.2′ (92H/4E)
On the east side of Highway 1, three-quarters of a mile east of Popkum.

OWNER: FRASER VALLEY LIME SUPPLIES, 976 Adair Avenue, Coquitlam.

WORK DONE: The pit remained closed and there was no production during the year. Machinery was removed from the grinding mill.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 467.

HARPER RANCH LIMESTONE QUARRY (No. 205, Fig. B)

By E. Sadar

LOCATION: Lat. 50° 40.3′ Long. 120° 03.9′ (92I/9E)
On the north side of South Thompson River, 11 miles east of Kamloops.

ACCESS: A bridge across the South Thompson River, 11 miles east of Kamloops, connects the plant with the Trans-Canada Highway.

OWNER: Canada Cement Lafarge Ltd.

OPERATOR: PLATEAU CONSTRUCTION LIMITED, Box 620, Kamloops.

WORK DONE: Limestone is quarried using a Gardner-Denver model 3300 airtrac and 600-cubic-foot-per-minute portable air compressor. A 988 Caterpillar loader is used to load a model R-35, 35-ton Euclid truck which hauls the limestone to the crusher. Production was 173,257 tons. In addition, the company diamond drilled one 400-foot hole.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 467.

DAHL LAKE QUARRY (No. 144, Fig. D)

By A. D. Tidsbury

LOCATION: Lat. 53° 47.5′ Long. 123° 17′ (93G/14W)
On the hill on Lot 3474 at the northeast corner of Dahl Lake, 22 miles southwest of Prince George.

ACCESS: By Highway 16, 22 miles west from Prince George, then 6 miles southwest to the quarry.

OWNER: KOKANEE CONTRACTING LIMITED, 3905 – 18th Avenue, Prince George.

WORK DONE:

Limestone is quarried by using stick explosives or AN/FO to blast holes drilled by wagon drills. Broken rock is put into trucks by front-end loaders and transported one-quarter mile to a crushing, screening, and washing plant. The processed stone is hauled to market at Prince George Pulp Mills by 35-ton Mack trucks pulling pups. Approximately 38 per cent of the treated material is too fine for market and a use for it for driveways and surfacing is being sought. Waste water and slimes are contained in a pond from which water is recycled. Approximately 23,800 tons of limestone was moved to market and 30,000 tons of waste was mined. No exploration or development was done during the year. Nominal daily capacity is 500 tons and on the average 14 men were employed.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 467.

PTARMIGAN CREEK QUARRY (No. 142, Fig. D)

By J. W. McCammon

LOCATION: Lat. 53° 40.8′ Long. 120° 54.3′ (93H/10W)
One and one-half miles west of the Canadian National Railways station at Urling, on the east bank of Ptarmigan Creek, 1 mile upstream from the railway bridge.

ACCESS: By a 4-mile-long dirt road north from Highway 16 at the east end of a rock cut 1.25 miles west of the highway bridge over Ptarmigan Creek. A 1-mile-long spur track from the quarry joins the Canadian National

Railways main line about 500 feet north of the railway bridge over Ptarmigan Creek.

OWNER: Canadian National Railways.

OPERATOR: QUESNEL REDI-MIX CEMENT CO. LTD., Box 2139, Quesnel.

DESCRIPTION:

This quarry is at the north end of a northwest trending ridge about 2 miles long. A face 700 feet long and nearly 300 feet high has been opened up along a bearing 25 degrees east of north across the end of the ridge. The quarry floor is just a few feet above the level of the creek but is well back from the edge of the water.

Limestone bedrock is exposed in all of the quarry face and in an area stripped for 150 feet south from the quarry lip, but is drift covered adjacent to the workings. More limestone can be seen across the creek from the southwest end of the quarry and also a short distance upstream where the creek tumbles over a falls. Other outcrops are reported southeast along the ridge.

The limestone is fine-grained, light blue to grey rock. At the northern end of the quarry brown and creamy streaks and patches containing dolomite, quartz, sericite, and other impurities are abundant. Apparently underlying this impure material is a zone 100 feet or more thick of good quality high-calcium stone. Below the pure limestone and toward the south end of the quarry the rock is very brown stained, vuggy, and broken up by numerous small faults and fractures. No definite bedding was recognized, but a vague, discontinuous, light and dark banding that strikes 10 degrees north of west and dips 28 degrees north was seen that may represent original bedding. This banding is nearly parallel to a strong set of joints. Other joints and slips abound oriented at various attitudes. Most of the fracture planes are coated with dirt or are heavily iron stained.

An areal map by the Geological Survey of Canada shows the limestone as part of the Cariboo Group of Lower Cambrian or earlier age.

A grab sample from a pile of crushed, sized, and washed rock from the clean high-calcium zone in the upper part of the quarry had the following percentage composition: CaO = 54.07, MgO = 1.54, Insol. = 0.46, R_2O_3 = 0.14, Fe_2O_3 = 0.11, MnO = trace, P_2O_5 = <0.5 ppm, S = trace, Ig. loss = 43.90, H_2O (105° C) = 0.02.

WORK DONE: In August 1972, the quarry was being worked from the floor at creek level and four benches at approximately equal intervals up the face. The high-calcium stone was crushed, screened, and washed for shipment to pulp mills in Prince George and Quesnel, and the impure stone was stockpiled for the Canadian National Railways for track ballast. Production, about 155,516 tons.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 467; *Geol. Surv., Canada*, Paper 68-1, Pt. A, 1967, Fig. 2, p. 18.

LAREDO LIMESTONE QUARRY (No. 30, Fig. F)

By B. M. Dudas

LOCATION: Lat. 52° 41.2′ Long. 129° 03′ (103A/11E)
On Lot 299 near the centre of the northeast shore of Aristazabal Island, directly southwest of Ramsbotham Island.

ACCESS: By boat or seaplane, 350 miles northwest from Vancouver or 120 miles south from Prince Rupert.

OWNER: KAMAD SILVER CO. LTD., 301, 141 Victoria Street, Kamloops.

WORK DONE: The property has been idle for the past two years. During 1972 Laredo Limestone Ltd., the former owner of the quarry, was acquired by Kamad Silver Co. Ltd. At year end, a feasibility study was being undertaken by Thyssen Mining Construction of Canada Ltd. to bring the quarry into operation in 1973.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, pp. 389-392.

TERRACE CALCIUM PRODUCTS LTD. QUARRY (No. 28, Fig. F)

By B. M. Dudas

LOCATION: Lat. 54° 30.7' Long. 128° 28.3' (103I/9W)
On Copper Mountain 4.5 miles east of Terrace at about 3,000 feet elevation.

ACCESS: By road 10 miles from Terrace by the British Columbia Telephone Company road to the Mount Thornhill microwave station.

OWNER: TERRACE CALCIUM PRODUCTS LTD., Box 207, Terrace.

WORK DONE: The quarry was worked intermittently by one man to produce 400 tons of limestone. A chip screen is to be added to the crushing circuit.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 468.

MAGNESITE

ROK (No. 130, Fig. A)

LOCATION: Lat. 50° 47' Long. 115° 39.5' (82J/13E)
GOLDEN M.D. At approximately 4,300 feet elevation about 20 miles northeast of Radium Junction, at the confluence of Assiniboine Creek and Mitchell River, chiefly on the west flank of Mount Brussilof.

CLAIMS: Three hundred and seventy-two.

ACCESS: By highway and bush road northeast from Radium, 30 miles.

OWNER: Baymag Mines Co. Limited.

OPERATOR: CANEX PLACER LIMITED, 800, 1030 West Georgia Street, Vancouver 5.

DESCRIPTION: Magnesite occurs as a lens in Lower Cambrian magnesium carbonate rocks.

WORK DONE: Claims and surface workings surveyed; surface geological mapping, 1 inch equals 1,000 feet covering portions of Rok, Joe, Mag, and Don claims; surface diamond drilling, 39 holes totalling 10,557 feet on Rock and Vano claims.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 503; Assessment Report 2048.

MARL

CHEAM MARL PRODUCTS (No. 250, Fig. B) By J. W. Robinson

LOCATION: Lat. 49° 11.5' Long. 121° 45' (92H/4W)
At Cheam Lake near Popkum.

ACCESS: By road 1 mile north from Highway 1 at Popkum.

OWNER: CHEAM MARL PRODUCTS LIMITED, 13 Fletcher Street South, Box 113, Chilliwack.

WORK DONE: Four men are employed at the Cheam Marl open pit. The material mined consists of a post-glacial deposit of marl that forms the bed of former Cheam Lake, drained several years ago. Marl and topsoil are excavated by two small draglines. The marl is spread on an asphalt drainage pad and air dried for a year. It is then loaded into trucks by a third dragline and delivered to consumers for agricultural use. Marl produced, 23,660 tons; marl shipped, 21,309 tons.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 468.

NEPHELINE SYENITE

BUCK (No. 154, Fig. A)

LOCATION: Lat. 49° 01.5' Long. 119° 35.5' (82E/4E)
OSOYOOS M.D. Five miles west of Osoyoos, 1.25 miles due east of Kilpoola Lake, between 3,500 and 4,000 feet elevation.

CLAIMS: BUCK 1 to 4.

ACCESS: By Highway 3 and dirt road west from Osoyoos.

OWNER: BETHLEHEM COPPER CORPORATION LTD., 2100, 1055 West Hastings Street, Vancouver 1.

DESCRIPTION: The property is underlain by a felsic nepheline syenite phase of the Kruger alkaline stock.

WORK DONE: Geological mapping, 1 inch equals 200 feet.

REFERENCE: Assessment Report 4130.

PHOSPHATE

PH (No. 128, Fig. A)

LOCATION: Lat. 49° 27.5' Long. 114° 40' (82G/7E)
FORT STEELE M.D. Along Flathead Valley road 4 miles south of Corbin on Michel Creek at 3,500 feet elevation.

CLAIMS: PH 7 to 12, 14, 16, and 17.

ACCESS: By road south from Corbin, 4 miles.

OPERATOR: MEDESTO EXPLORATION LTD., 215A – 10th Street NW., Calgary, Alta.

DESCRIPTION: Nodular sedimentary phosphate rock occurs at the base of the Fernie Group.

WORK DONE: Surface diamond drilling, two holes totalling 120 feet on PH 10.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 468.

WW (No. 129, Fig. A)

LOCATION: Lat. 49° 27.5′ Long. 114° 42′ (82G/7E)
FORT STEELE M.D. At approximately 5,500 feet elevation near Barnes Lake, 5 miles southwest of Corbin.

CLAIMS: WW, totalling 40.

ACCESS: By road south and west from Corbin, 5 miles.

OPERATOR: WESTERN WARNER OILS LTD., 4, 215A – 10th Street NW., Calgary, Alta.

DESCRIPTION: Outcropping rocks range from Mississippian to Jurassic in age and comprise a thick sequence of marine and terrestrial sedimentary phases. Phosphate rock is sedimentary and lies at the base of the Fernie Group.

WORK DONE: Surface geological mapping, 1 inch equals 100 feet on WW 2; surface diamond drilling, five holes totalling 280 feet on WW 102 and 104.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 469.

SAND AND GRAVEL

LAFARGE CONCRETE LTD. (No. 174, Fig. C)

LOCATION: Lat. 49° 45′ Long. 124° 30′ (92F/9W)
Between sea-level and 500 feet elevation on the east side of Texada Island, near Raven Bay.

ACCESS: By air or water from Vancouver, 70 miles.

OPERATOR: LAFARGE CONCRETE LTD., 1051 Main Street, Vancouver 3.

DESCRIPTION: Glacial deposit of gravel occurs above a depression in bedrock.

WORK DONE: Topography mapped; surface geological mapping, 1 inch equals 500 feet; resistivity and seismic tests covering 2 line-miles.

Data on sand and gravel production are presented on the following pages. The abbreviations used in the table for the types of sand and gravel produced are as follows: AA = asphalt aggregate; SA = sized aggregate; WS = washed and sized aggregate; S = sand; RP = run-of-pit material; CA = crushed aggregate; AP = asphalt paving mix; RM = ready-mix concrete.

Sand and Gravel Pits

Location	Operator	Equipment	Men	Production
Prince Rupert Highways District—				
(1) Alice Arm pit, Mile 2, Kitsault Road	Department of Highways	Front-end loader, truck	1	RP = 216 yd.
(2) Alice Arm pit, Mile 4, Kitsault Road	Department of Highways	Front-end loader, truck	1	RP = 136 yd.
(3) Alice Arm pit, Mile 5, Kitsault Road	Department of Highways	Front-end loader, truck	1	RP = 51 yd.
(4) Alice Arm pit, Mile 7, Kitsault Road	Department of Highways	Front-end loader, truck	1	RP = 198 yd.
(5) Queen Charlotte Islands, Masset, D.L. 807A, 807, 808	Department of Highways	One loader, one truck	2	RP = 553 yd.
(6) Queen Charlotte Islands, Tlell private property	Department of Highways	One loader, three trucks	4	S = 5,493 yd.
(7) Queen Charlotte Islands, construction pit, D.L. 803, 799	Department of Highways	One loader, eight trucks	9	RP = 25,110 yd.
(8) Queen Charlotte Islands, Yellow pit, D.L. 773	Department of Highways	One loader, one truck	2	RP = 180 yd.
(9) Queen Charlotte Islands, Ross pit, D.L. 1349	Department of Highways	One loader, one truck	2	RP = 260 yd.
(10) Queen Charlotte Islands, St. Mary's pit, D.L. 591 to 593	Department of Highways	One loader, one truck	2	Rock = 45 yd.
(11) Queen Charlotte Islands, Skidegate, D.L. 2794, 2799	Department of Highways	One loader, two trucks	3	RP = 823 yd.
(12) Queen Charlotte Islands, Miller Creek pit, D.L. 497	Department of Highways	One loader, one truck	2	RP = 100 yd.
(13) Queen Charlotte Islands, Queen Charlotte City yardsite, D.L. 16, 16A	Department of Highways	One loader, one truck	2	RP = 84 yd.
(14) Queen Charlotte Islands, Mile 7 pit, D.L. 394, 401	Department of Highways	One loader, one truck	2	S = 145 yd.
(15) Queen Charlotte Islands, Tow Hill Beach Crown Land, foreshore deposits	Department of Highways	One loader, two trucks	3	S = 835 yd.
(16) Prince Rupert, Green River pit, D.L. 1746, 4408	Department of Highways	One loader, six trucks	7	S = 6,800 yd.
(17) Prince Rupert, Green River pit, D.L. 1746, 4408	Department of Highways	One loader, six trucks	7	RP = 20,000 yd.
(18) Construction pits, Bear River Pass	Department of Highways	One loader, ten trucks	11	RP and CA = 162,662 yd.
(19) Surprise Creek pit	Department of Highways	One loader, five trucks	6	RP = 22,680 yd.
(20) American Creek pit, Mile 16	Department of Highways	One loader, three trucks	4	Rock = 3,402 yd.
(21) American Creek pit, Mile 16	Department of Highways	One loader, five trucks	6	RP = 25,204 yd.

Sand and Gravel Pits—Continued

Location	Operator	Equipment	Men	Production
Prince Rupert Highways District—*Continued*				
(22) Nass Road Meziadin Lake pit	Department of Highways	One loader, four trucks	5	RP = 11,733 yd.
(23) Lot 523, Tuck Inlet	Rivtow Straites Limited	One 4-yard clam excavator, one 1,000-yard scow	8	RP.
(24) Lot 1394, Porcher Island	Rivtow Straites Limited	One 4-yard clam excavator, one 1,000-yard scow		RP.
(25) Lot 4447, Porcher Island	Rivtow Straites Limited	One 4-yard clam excavator, one 1,000-yard scow		RP.
(26) Skeena River (near Prince Rupert)	Armour Salvage (1949) Ltd.	One 4-yard clam excavator, one 1,000-yard scow	8	RP.
(27) Lot 1382, Lot 1383, Tugwell Island	Armour Salvage (1949) Ltd.	One 4-yard clam excavator, one 1,000-yard scow		RP.
(28) Lot 1983, Porcher Island	Armour Salvage (1949) Ltd.	One 4-yard clam excavator, one 1,000-yard scow		RP.
(29) Lot 6957, Porcher Island	Armour Salvage (1949) Ltd.	One 4-yard clam excavator, one 1,000-yard scow		RP.
Terrace Highway District—				
(1) Mile 1, Old Lakelse Road, pit 1	Department of Highways	Front-end loader, two 4-ton trucks, screening plant	5	S = 5,000 yd.
(2) Mile 2.6, Highway 16 East, pit 3	Department of Highways	One loader, two tractors, two 4-ton trucks, one crusher	7	CA = 20,000 yd.
(3) Mile 9, Highway 25, pit 7	Department of Highways and L.G. Scott	Two loaders, two tractors, three 4-ton trucks, seven tandem trucks, one portable crusher	20	CA = 30,000 yd.
(4) Mile 34, Highway 25, pit 33	Department of Highways	One crusher, two tractors, two 4-ton trucks, one loader	7	S = 5,000 yd.
(5) Mile 35.5, Salvus 16 West	Department of Highways	One loader, eight tandem trucks, three Caterpillars, air-trac	20	RP = 100,000 yd., Rock = 20,000 yd.
(6) Mile 43, Polymar Bar	Department of Highways	One loader, five tandem trucks, two Caterpillars, dragline	15	RP = 30,000 yd.
(7) Mile 47, Kwinitsa Bar	Department of Highways	One loader, three tandem trucks, dragline, crusher	10	CA = 8,000 yd.
(8) Mile 6, Beam Station Road, pit 23	Department of Highways	One loader, three 4-ton trucks	5	RP = 2,000 yd.
(9) Mile 18, Kalum Lake Road, pit 34	Department of Highways	One loader, three 4-ton trucks	5	RP = 3,000 yd.

Sand and Gravel Pits—Continued

Location	Operator	Equipment	Men	Production
Terrace Highway District—*Continued*				
(10) Mile 32, Highway 16 West	Department of Highways and Peter Kiewit & Sons	One loader, one tractor, seven tandem trucks	12	CA = 100,000 yd., RP = 50,000 yd.
(11) Mile 42, Highway 16 West, rock quarry	Department of Highways	One loader, two tractors, five tandem trucks	10	Rip-rap = 20,000 yd.
(12) Sandhill—Kitimat	Ocean Construction Supplier Northern Ltd.	One 5-yard Sauerman scraper and hoist, one H90E loader, 1 TD-7 tractor	5	CA and RP.
(13) L.H. and K. pit, Terrace	L.G. Scott & Sons Construction	One 950 front-end loader, one D-7 and one D-8 Caterpillar tractors, and one Hough 120 front-end loader	7	CA and RP.
Fort St. John Highway District—				
(1) Imperial pit, Boundary Lake	Department of Highways	Crusher, front-end loader	25	AA and CA = 75,000 tons.
(2) Imperial pit, Boundary Lake	Department of Highways	Loader, trucks	15	RP = 10,000 yd.
(3) Nolan pit, Doig River	Department of Highways	Loader, trucks	15	RP = 20,000 tons.
(4) Woods pit, Beatton River	Department of Highways	Loader, trucks	25	AA and CA = 75,000 tons.
(5) Clark pit, Taylor	Department of Highways	Crusher, two trucks, one bulldozer	7	CA = 43,335 tons.
(6) Thomas pit, Cache Creek	Glenn Fox (Highways pit)	Front-end loader	3	RP = 200 yd.
(7) Kledo Creek pit, Fort Nelson	Department of Highways	Crusher, loader, trucks	20	CA = 50,000 tons.
(8) Stareck pit, Fort St. John	Department of Highways	Caterpillar, ripper, loader, trucks		RP = 6,000 tons, CA = 6,200 tons.
(9) Peace Hill, Moose Creek	Department of Highways	Crusher	7	CA = 27,473 tons.
(10) Triad pit, Beatton River	Department of Highways	Loader, trucks	10	RP = 4,000 yd.
(11) Upper Halfway pit	Department of Highways	Loader, trucks	10	RP = 3,000 yd.
(12) McLean pit, Fort St. John	Department of Highways	Crusher	7	CA = 24,618 tons.
(13) Hotel Creek, Dease Lake	Department of Highways	Crusher, loader, trucks	14	CA = 60,000 tons.
(14) Gnatt pit, Mile 184.2, Cassiar Highway	Department of Highways	Crusher, loader, trucks	14	CA = 60,000 tons.
(15) Eddontenajon pit, Mile 220.3, Cassiar Highway	Department of Highways	Crusher, loader, trucks	14	CA = 55,000 tons.
(16) Mile 295 pit, Fort Nelson	J.H. Hansen (from Dept. pits)	Loader, trucks	2	RP = 1,050 yd.
(17) Mile 295 pit, Fort Nelson	Strand (from Dept. pits)	Loader, trucks	2	RP = 1,400 yd.
(18) Moore pit, Taylor	Swanberg Bros. (from Dept. pits)	Loader, trucks	5	RP = 2,000 yd.
(19) Inga Lake pit, Mile 91, Highway 97	Hirtz Bros. Const. (from Dept. pits)	Loader, trucks	2	RP = 150 yd.
(20) Inga Lake pit, Mile 91, Highway 97	Pacific Petroleums Ltd. (from Dept. pits)	Loader, trucks	5	RP = 4,000 yd.

Sand and Gravel Pits—Continued

Location	Operator	Equipment	Men	Production
Fort St. John Highway District—*Continued*				
(21) Imperial pit, Boundary Lake	Texaco Explorations Canada Ltd. (from Dept. pits)	Loader, trucks	5	RP = 2,000 yd.
(22) Mile 295 pit, Fort Nelson	Department of Highways	Loader, trucks	5	RP = 5,000 yd.
Coquitlam Municipality—				
(1) West end of Westwood Road	Corporation of the District of Coquitlam	Front-end loader, portable crushing, screening	1	RP and SA.
(2) Pipeline Road, 3½ miles north of Lougheed Highway	Jack Cewe Ltd., Box 1100, Coquitlam	Front-end loader, crushing, screening, paving plant	12	RP, SA, and AP.
(3) Pipeline Road, 3 miles north of Lougheed Highway	S & S Sand and Gravel Ltd., RR 1, Port Coquitlam	Front-end loader, crushing, screening, washing	2	RP and SA.
(4) Pipeline Road, 3 miles north of Lougheed Highway	Columbia Bitulithic Ltd., Box 4225, Station D, Vancouver 9	Front-end loader, crushing, screening	–	RP and SA.
(5) Pipeline Road, 3 miles north of Lougheed Highway	Allen Contracting Ltd., RR 1, 1520 Pipeline Road, Port Coquitlam	Front-end loader, trucks, crushing, screening	5	RP and SA.
(6) Pipeline Road, 1½ miles north of Lougheed Highway	Allard Contractors Ltd., Box 47, Port Coquitlam	Front-end loader, crushing, screening	5	RP and SA.
(7) Pipeline Road, 1 mile north of Lougheed Highway	Canada Cement Lafarge Ltd., 1051 Main Street, Vancouver	Dragline, front-end loaders, trucks, crushing, washing, screening, ready-mix	10	SA, WS, and RM = 600,000 yd.
(8) Pipeline Road, 4 miles north of Lougheed Highway	Allard Contractors Ltd., Box 47, Port Coquitlam	Shovel, trucks	2*	RP.
(9) Fraser River at Mary Hill, 2 miles south of Port Coquitlam	Construction Aggregates Ltd., 850 S.W. Marine Drive, Vancouver 14	Shovels, front-end loader, trucks, processing plant, barge-loading facilities	65	WS, CA, and SA.
Annacis Island—Fraser River at Annacis Island	Willson Construction Co. Ltd., 4984 - 48th Ave., Ladner	Front-end loader	2	S.
Maple Ridge Municipality—				
(1) 33rd Road, 1 mile south of Silver Valley	S. Berto, RR 2, Maple Ridge	Front-end loader, trucks	1*	RP
(2) Grant Hill, 1 mile east of Albion and also adjoining Kirkpatrick pit	Corporation of the District of Maple Ridge	Front-end loader, crushing	–	RP and SA.
(3) Grant Hill, ¾ mile north of municipal pit	Williamson Blacktop and Landscaping Ltd., Haney	Front-end loader, crushing, screening	–	RP and SA.
(4) Grant Hill, ½ mile north of municipal pit	Allard Contractors Ltd., Box 47, Port Coquitlam	Front-end loader, crushing, washing, screening	2	WS.

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* Part time employee(s)

Sand and Gravel Pits—Continued

Location	Operator	Equipment	Men	Production
Maple Ridge Municipality—*Continued*				
(5) Grant Hill, ½ mile north of municipal pit	McIntosh Sand and Gravel Ltd., 10412 Industrial Ave., Whonock	Front-end loaders, crushing, screening, washing	4	RP, WS, and SA.
(6) Lougheed Highway south of Grant Hill	Walske Ready Mix Ltd., 23616 River Road, Haney	Shovel, front-end loader, crushing, washing, screening, readymix, mixer trucks	20	WS and RM = 175,180 yd.
(7) Albion	Columbia Bitulithic Ltd., Box 4225, Station D, Vancouver 9	Front-end loader, crushing, screening	—	RP and SA.
(8) Alouette River, east end of 27th St.	Kirkpatrick Sand and Gravel Ltd., 22357 McIntosh Street, Haney	Front-end loader	2*	RP.
(9) One mile north of Websters Corners, ½ mile east	Kirkpatrick Sand and Gravel Ltd., 22357 McIntosh Street, Haney	Shovel, washing, screening	2*	RP and WS.
(10) Maple Ridge, east of 284th St.	Douglas Lasser, 22586 - 129th Ave., Haney	Front-end loader	1*	RP.
(11) Maple Ridge, east of 284th St.	C. Cozens, Maple Ridge		—	RP.
(12)	Various operators, but owned by L.J. Donatelli, 29579 Lougheed Highway, RR 2, Mission City	Front-end loaders, trucks	4*	RP = 3,930 yd.
Mission Municipality—				
(1) 2.3 miles south of Steelhead, Dewdney Trunk Road	Cannon Contracting Ltd., Box 178, Mission	Front-end loader, crushing, screening	2*	RP and SA.
(2) 2.2 miles south of Steelhead, Dewdney Trunk Road	M. Catherwood, RR 1, Mission		1*	RP.
(3) 1 mile east of Stave Falls powerhouse	Corporation of the District of Mission		—	S.
(4) 3 miles east of Stave Falls powerhouse	Corporation of the District of Mission		—	RP.
(5) 2 miles east of Ruskin powerhouse	Corporation of the District of Mission	Front-end loader	2	RP and SA.
(6) Mission	Department of Highways, Chilliwack	Front-end loader, screening	—	RP and SA.
Kent Municipality—				
(1) West of Cemetery Road, south of Mount Agassiz	Corporation of the District of Kent	Shovel	2	RP.
(2) McCallum Road, 1½ miles west of Harrison Hot Springs Road	Danielson Contracting Ltd., McCallum Road, RR 1, Agassiz	Front-end loader	2*	RP.
(3) McCallum Road	Department of Highways, Chilliwack	Front-end loader, screening	1	RP and SA = 5,400 yd.

* Part time employee(s)

Sand and Gravel Pits—Continued

Location	Operator	Equipment	Men	Production
Kent Municipality—*Continued*				
(4) Fraser River bar, directly south of Agassiz	Morrow's Trucking & Reddi-Mix Ltd., 7505 Morrow Road, Agassiz	Front-end loader, trucks, screening	3	RP, SA, and RM = 8,000 yd.
(5) 1 mile north of Agassiz	Department of Highways	Front-end loader, trucks	2	RP.
(6) ½ mile south of Rosedale-Agassiz Bridge	Department of Highways	Front-end loader, trucks	2	RP.
(7) ½ mile west of Hunter Creek	Department of Highways	Front-end loader, trucks	2	RP.
Indian Reserve No. 1—Cheam View	Various Operators	Front-end loader, trucks	2*	RP.
Chilliwack Municipality—				
(1) Arnold Road, bank of Fraser River	P. Heppner & Son Trucking, 7113 Sumas Prairie Road, Sardis	Front-end loader	2*	RP.
(2) Fraser River bars, etc.	Chilliwack Gravel Sales Ltd.	Bucket-line dredge, front-end loader, screening plant	3	RP and WS = 50,000 yd.
Hope—8 miles north of Hope Fraser River bars	Channel-Bar Mining Co. Ltd.	Front-end loader, trucks	–	RP and WS.
Sumas Municipality—at foot and east of Taggart Peak	P. Heppner & Son Trucking, but owned by H. Quadling, RR 1, Yarrow	Front-end loader, screening	5*	RP and SA.
Matsqui Municipality—				
(1) 1 mile east of Abbotsford	Blackham's Construction Ltd., Box 39, Abbotsford	Front-end loaders, screening, washing, crushing	4	RP SA, and WS = 136,860 yd.
(2) Trethewey Road, ¾ mile north of Clearbrook	Department of Highways, Chilliwack	Front-end loader, screening	4	RP and SA.
(3) Clearbrook Road, ½ mile north of border	Abbotsford Gravel Sales Ltd., Box 8, Abbotsford	Scraper, front-end loader, screening, washing, readymix plant of Totem Trucking Ltd.	3	WS, RP, and RM.
(4) 12th Ave., ¼ mile west of Clearbrook Road	Valley Rite-mix Ltd., Box 430, Clearbrook	Scraper, front-end loader, screening, washing, crushing, ready-mix plant	4	RP, SA, WS, and RM.
(5) Corner LeFeuvre Road and Eighth Ave., Caplette pit	Ernie's Trucking Ltd., Box 365, Aldergrove	Front-end loader	1	RP.
(6) LeFeuvre Road	Corporation of the District of Matsqui	Front-end loader, crushing, screening	–	RP and SA.
Langley Municipality—				
(1) Kinch Road at 36th Ave. and Jackman Road	Corporation of the Township of Langley	Front-end loader, crushing, screening	4	RP and SA.
(2) North of the northeast corner of Jackman Road and Eighth Ave.	Aldergrove Cement Tile Products, 2437 - 272nd Street, RR 1, Aldergrove	Front-end loader, screening	1*	RP, WS, and Topsoil.
(3) Dogwood Ave., off Brown Road	Kitsul Bros. Gravel Sales Ltd., 24306 Fraser Highway, RR 3, Langley	Front-end loader	2*	RP and S.

* Part time employee(s)

Sand and Gravel Pits—Continued

Location	Operator	Equipment	Men	Production
Langley Municipality—*Continued*				
(4) Glen Valley Road at 252nd St.	Fort Langley Aggregates Ltd., 25394 River Road, RR 6, Langley	Dragline, front-end loader, crushing, screening, washing	5	RP, WS, and SA.
(5) 8802 Hudson Bay Road, Fort Langley	Clark Gravel & Ready Mix Ltd., Box 855, Langley	Front-end loader, crushing, screening, washing	3	RP, WS, and RM.
(6) 2962 Lambert Road, Highland pit	Construction Aggregates Ltd., 850 S.W. Marine Drive, Vancouver 14	Dragline, front-end loader, crushing, screening, washing	8	RP, WS, and SA.
(7) 32nd Ave. at Kinch Road	Oscar Rees Gravel Sales Ltd., Box 847, Langley	Dragline, front-end loader, screening	5	RP and SA.
(8) Boundary Road at Surrey boundary	Border Sand & Gravel Ltd., Boundary Ave., RR 2, White Rock	Front-end loader, crushing, screening, washing	5	RP and WS = 135,248 yd.
Surrey Municipality—				
(1) Campbell River Road at Langley boundary	White Rock Sand and Gravel, 2546 - 176th St., RR 2, Cloverdale	Shovel, front-end loader, screening, washing	3	RP, SA, and WS.
(2) 24th Ave. at Langley boundary	Corporation of the District of Surrey	Front-end loader	–	RP and SA.
(3) 160th St., south of 24th Ave.	Corporation of the District of Surrey	Front-end loader	–	RP.
(4) 53rd Ave. at Delta boundary	Corporation of the District of Surrey	Front-end loader	–	RP.
(5) 28th Ave. at 194th St.	Corporation of the District of Surrey	Front-end loader	–	RP.
(6) 96th Ave. at Langley boundary	Corporation of the District of Surrey	Front-end loader	–	RP and SA.
Delta Municipality—				
(1) ½ mile west of Scott Road at 68th St.	Standard General Construction (International) Limited, 6631 - 120th St., North Surrey	Front-end loaders, crushing, screening, washing	9	RP, WS, and SA.
(2) 10720 - 84th Ave.	M & W Sand and Gravel Ltd., 948 Beckwith Road, Richmond	Front-end loader	–	RP.
(3) Fraser River at Annieville	Sabre Bulldozing Ltd., 719 No. 3 Road, Richmond	Front-end loader	2	S.
Howe Sound—				
(1) Britannia Beach	Construction Aggregates Ltd., 850 S.W. Marine Drive, Vancouver 14	Bulldozers, front-end loaders, trucks, crushing, washing, screening	40	WS, RP, and SA.
(2) Furry Creek	Construction Aggregates Ltd., 850 S.W. Marine Drive, Vancouver 14	Bulldozers, front-end loaders, trucks, crushing, screening	14	SA and WS.
(3) Mamquam River	Coast Aggregates Ltd., Squamish	Front-end loader, trucks, crushing, screening	3	RP and SA = 588,447 yd.

Sand and Gravel Pits—Continued

Location	Operator	Equipment	Men	Production
Howe Sound—*Continued*				
(4) North of Cemetery Road, Gibsons	Universal Aggregate, Box 323, Gibsons	Front-end loader, crushing, screening	2	RP and SA.
(5) Cemetery Road, Gibsons	P & W Development Co. Ltd., Box 248, Gibsons	Front-end loader, crushing, screening, readymix	1*	RP and RM.
(6) Veterans Road, Gibsons	Gibsons Building Supplies Ltd., Gibsons	Front-end loader, crushing, screening, washing	3	RP and WS.
(7) South of Sechelt Highway, west of Veterans road, Gibsons	Gibsons Building Supplies Ltd., Gibsons	Front-end loader	1*	RP.
(8) Porpoise Bay Road, Sechelt	L & H Swanson Ltd., Box 172, Sechelt	Front-end loader, trucks, screening, readymix	8	RP, SA, and RM = 12,420 yd.
Jervis Inlet—Treat Creek	Delta Rock Ltd., Box 1100, Coquitlam	Front-end loaders, crushing, screening	10	RP and SA = 395,000 yd.
Lang Bay—1 mile north of Lang Bay		Front-end loader, crushing, screening, washing	2	RP, WS, and SA.
Powell River—				
(1) Off Allen Road, 3 miles northeast of Westview	P. Nassichuk, 7123 Alberni St., Powell River	Front-end loader, screening	1	RP and S = 3,233 yd.
(2) Yukon Ave., Cranberry Lake	John Sarnowski, RR 1, Powell River	Front-end loader, crushing, screening, washing	3*	RP, WS, and SA.
(3) Paradise Valley Road, Hammil Lake	D. Carto, Wilde Road, Powell River		1*	RP.
Vancouver Island—				
(1) Campbell River—north of Buttle Lake Road at Elk Falls Road	Gord Noren Trucking Ltd., Box 345, Campbell River	Front-end loader	3*	RP = 5,224 yd.
(2) Campbell River—south of Buttle Lake Road at Elk Falls Road	Antonelli Trucking Ltd., Box 189, Campbell River	Front-end loader	1	RP.
(3) Campbell River—south of Buttle Lake Road at Elk Falls Road	C.R. Readi-Mix and Gravel Supplies Ltd., 1920 Antonelli Road, Campbell River	Front-end loader, crushing, washing, screening	2*	RP, SA, and WS
(4) Painter's Spit, Campbell River	Island Readimix Limited	High-line scraper, front-end loader, crushing, washing, screening, readymix	3	WS, SA, and RM = 33,252 yd.
(5) Courtenay—Cumberland Road near Cumberland	W.J. Woods Trucking	Front-end loader	1*	RP.
(6) Courtenay—Cumberland Road near Cumberland	Chinook Gravel, RR 1, Courtenay	Front-end loader	–	RP.
(7) Courtenay—Cumberland Road near Courtenay	Island Ready-Mix Limited	Front-end loader, crushing, washing, screening	6	RP, WS, and SA = 46,107 yd.

* Part time employee(s)

Sand and Gravel Pits—Continued

Location	Operator	Equipment	Men	Production
Vancouver Island—*Continued*				
(8) Courtenay—Cumberland Road near Courtenay	George Bates	Front-end loader, screening	1	RP and SA.
(9) Courtenay—Cumberland Road near Courtenay	R.E. Longland Trucking Ltd.	Front-end loader, screening	2	RP and SA.
(10) Hector Road, Alberni	Dolan's Limited	Front-end loader	1*	RP.
(11) Falls Road, Alberni	Dolan's Limited	Front-end loader, crushing, washing, screening	2	RP, WS, and SA.
(12) McKenzie Road, Alberni	Dolan's Limited	Front-end loader	2	RP.
(13) Alberni	Department of Highways	Front-end loader, crushing, screening	—	RP and SA = 25,000 yd.
(14) Church Road, Errington	D.M. Beaton	Front-end loader	1*	RP = 8,655 yd.
(15) Errington	Department of Highways	Front-end loader, crushing, screening	—	RP and SA = 39,000 yd.
(16) Parksville, 2 miles west	Fouty Brothers Contracting Ltd.	Front-end loader	1*	RP.
(17) Parksville, 2 miles west	Jim Jenkins Ltd.	Front-end loader	1*	RP.
(18) Dumont Road, Nanaimo	Reg. Dorman Trucking & Fuel Ltd.	Front-end loader	1	RP.
(19) Dumont Road, Nanaimo	Department of Highways	Front-end loader, crushing, screening	—	RP and SA = 107,000 yd.
(20) McGirr Road, Nanaimo	Department of Highways	Front-end loader, screening	—	RP and SA = 25,000 yd.
(21) Island Highway north of Nanaimo	Island Excavating Co. Ltd.	Front-end loader	1*	RP.
(22) Cassidy	Department of Highways	Front-end loader, crushing, screening	—	RP and SA = 67,000 yd.
(23) Cassidy, ½ mile west of Island Highway, north of Nanaimo River	Hub City Paving and Construction Ltd., Box 427, Nanaimo	Front-end loader, crushing, washing, screening	3	RP, WS, and SA.
(24) Spruston Road, Cassidy	Van-Isle Sand and Gravel	Front-end loader, crushing, screening	2	RP and SA = 1,604 yd.
(25) Rosevear Road, Duncan	Mayer Bros. Contracting Ltd., Crofton	Front-end loader, crushing, screening	2	RP and SA.
(26) Duncan—Cowichan Lake Road	Butler LaFarge Ltd., Canada Ave., Duncan	Front-end loader, crushing, washing, screening, ready-mix	9	RP, WS, SA, and RM.
(27) Duncan	Department of Highways	Front-end loader, crushing	—	RP and SA = 33,000 yd.
(28) Duncan—Koksilah	Armour & Saunders Ltd., 2739 James St., Duncan	Front-end loader, crushing, screening, washing	10	RP, WS, and SA = 109,891 yd.
(29) Cobble Hill	Gravel Hill Supplies Ltd., Cobble Hill	Front-end loader, washing, screening, ready-mix	6	RP, WS, SA, and RM.
(30) Cobble Hill	Hillbank Gravel Supplies	Front end loader	2	RP.
(31) Goldstream—Sooke Lake Road at Humpback Road	OK Trucking Co. Ltd., 750 Topaz Ave., Victoria	Front-end loader	2*	RP.
(32) Goldstream—Turner Meadows	E. Nixon Ltd., 400 Burnside Road, East, Victoria	Front-end loader, screening	3*	RP and SA 31,332 yd.

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* Part time employee(s)

Sand and Gravel Pits—Continued

Location	Operator	Equipment	Men	Production
Vancouver Island—*Continued*				
(33) Keating Cross Road, Saanich	D. McHattie	Front-end loader	1	RP.
(34) Keating Cross Road, Saanich	Butler Brothers Supplies Ltd., Box 4066, Station A, Victoria	Shovel, front-end loader, crushing, washing, screening, ready-mix	10	RP, WS, SA, and RM
(35) Cordova Bay Road, Saanich	Trio Ready-Mix (1971) Ltd., 774 Cordova Bay Road, Victoria	Front-end loader, crushing, washing, screening, ready-mix	3	RP, WS, SA, and RM = 62,221 yd.
(36) Langford Lake	G. McRae	Front-end loader, screening	2	RP and SA.
(37) Langford	Columbia Ready Mix Ltd., 2949 Phipps Road, Victoria	Front-end loader, crushing, washing, screening, ready-mix	3	RP, WS, SA, and RM = 37,506 yd.
(38) Metchosin	Columbia Ready Mix Ltd., 2949 Phipps Road, Victoria	Front-end loader, screening	2	RP and SA = 165,745 yd.
(39) Metchosin	Construction Aggregates Ltd., 3497 Metchosin Road, Victoria	Front-end loader, crushing, washing, screening	12	RP, WS, and SA = 677,400 yd.
(40) Sooke—Sooke Road east of Milnes Landing	Butler Brothers, Sooke Division, Box 549, Sooke	Front-end loader, crushing, washing, screening, ready-mix	5*	RP, WS, SA, and RM = 19,131 yd.
Gulf Islands—Rainbow Road, Saltspring Island	Gulf Coast Materials Ltd., Ganges	Front-end loader	1*	RP.
Kamloops Indian Reserve—				
(1) Yellowhead Highway north of Kamloops	Metro Sand and Gravel Limited	Front-end loader	6–8	RP = 32,655 yd.
(2) At junction of Yellowhead Highway and Paul Lake Road, north of Kamloops	Ocean Construction Supplies Northern Limited	Front-end loader, bulldozer	4	RP = 154,000 yd.
Nelson—Anderson Creek	Premier Sand & Gravel Company Limited	Front-end loader, crushing, screening	5	RP, WS, and RM.
Creston—Goat River	Louis Salvador & Sons	Front-end loader, crushing, screening	3	RP, WS, and RM.
Castlegar—Columbia River	McGauley Ready-Mix Concrete Company	Front-end loader, screening	3	RP, WS, and RM.
Trail—				
(1) Casino Road	McGauley Ready-Mix Concrete Company	Front-end loader, screening	4	RP, WS, and RM.
(2) Marianna Crescent	H. Williamson Blacktop & Landscaping Ltd.	Front-end loader, crushing, screening	5	AP.
Cranbrook—				
(1) Theatre Road	Louis Salvador & Sons	Front-end loader, crushing, screening	4	RP, WS, and RM.
(2) Theatre Road	Kooteney Concrete Ltd., and A.G. Boyes Ltd.	Front-end loader, crushing, screening	5	RP, WS, and RM.
Kimberley—Meadowbrook	Fontaine's Transfer Ltd.	Front-end loader, crushing, screening	2	RP, WS, and RM.

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* Part time employee(s)

SILICA

VAL (No. 41, Fig. A)

LOCATION: Lat. 49° 02.6′ Long. 118° 39′ (82E/2E)
GREENWOOD M.D. Four miles south of Greenwood and 2 miles east of Boundary Falls.
CLAIMS: VAL 1 and 2, MINT 5, 7 to 10, 14 to 19, SIL 1, 3 to 8, 2 Fraction.
ACCESS: By Highway 3 and secondary road from Greenwood.
OPERATOR: SILCAN RESOURCES LTD., 208 Professional Building, Lethbridge, Alta.
DESCRIPTION: Quartzite occurs as a bed or lens between layers of argillite.
WORK DONE: Geological mapping.
REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1967, p. 320; Assessment Report 3917.

OLIVER SILICA QUARRY (No. 166, Fig. A)

By David Smith

LOCATION: Lat. 49° 11.7′ Long. 119° 33.2′ (82E/4E)
OSOYOOS M.D. One-quarter mile west of Highway 97, 1 mile north of Oliver.
CLAIM: GYPO (Lot 3098s).
ACCESS: By road from Oliver.
OWNER: Cominco Ltd.
OPERATOR: PACIFIC SILICA LIMITED, 717 West Pender Street, Vancouver 1; field address, Box 39, Oliver.
WORK DONE: There was no production from the pit in 1972. Reclaim from the stockpiles was carried out continuously, employing three men. Shipments in 1972, 10,905 tons.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 478.

SHEEP CREEK CAMP (No. 191, Fig. A)

LOCATION: Lat. 49° 09′ Long. 117° 09′ (82F/3E)
Report on this property under metals in section 82F/3E.

HCJ, CAM (No. 25, Fig. A)

LOCATION: Lat. 51° 14′ Long. 116° 52.5′ (82N/7W)
GOLDEN M.D. Between 3,500 and 4,000 feet elevation north of Horse Creek, 6 miles southeast of Golden.
CLAIMS: HCJ 1 to 3, CAM 1 to 13, 15, 17, 19, 21, 23, BCL 1 and 2.
ACCESS: By highway and gravel road south from Golden, 4 to 12 miles.
OWNER: D. A. CAMPBELL, 10715 – 116th Street, Edmonton, Alta.
DESCRIPTION: The claims cover an area where a thickness of several hundred feet of the Ordovician Mount Wilson (Wonah) Formation quartzite outcrops. Some of the quartzite is very pure silica.

WORK DONE: Surface geological mapping, 1 inch equals 200 feet covering HCJ 1 to 3.
REFERENCE: Assessment Report 3685.

SCUZZY CREEK (No. 104, Fig. B)

LOCATION: Lat. 49° 50′ Long. 121° 35′ (92H/13E)
NEW WESTMINSTER M.D. Along Scuzzy Creek from 6 to 10 miles west of its confluence with the Fraser River, at approximately 2,600 feet elevation.
CLAIMS: APLO 1 and 2, LYN 1 to 5, MIDGE 1 to 20, 23 and 24, NAN 1 to 8, MIN 1, HELEN, JAN, BOB.
ACCESS: By gravel road south and west from Boston Bar, approximately 12 miles.
OWNER: INDUSMIN LIMITED, Box 40, Commerce Court West, Toronto, Ont.
DESCRIPTION: The entire highland surrounding Scuzzy Creek consists of remarkably uniform coarse-grained quartz diorite.
WORK DONE: Surface geological mapping, 1 inch equals 200 feet covering Aplo 1 and 2, Lyn 2 to 5, Midge 13, 14, and 24, and Nan 1 to 8; surface work, test pits on Aplo 1, Nan 1, Lyn 4, and Midge 2; overburden drilling, 12 holes totalling 182 feet on Lyn 4, Aplo 1, Nan 1, 5, 7, Bob, Helen, and Jan.
REFERENCES: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 478; Assessment Report 3760.

BUSE LAKE QUARRY (No. 206, Fig. B)

LOCATION: Lat. 50° 37.3′ Long. 120° 01.5′ (92I/9E)
KAMLOOPS M.D. At the southeast corner of Buse Lake, on the Barnhart Vale-Monte Lake road, 14 miles east-southeast of Kamloops.
CLAIMS: BUSE 1 and 2.
ACCESS: Seven miles south by road from Canada Cement Lafarge plant, 11 miles east of Kamloops.
OWNER: Canada Cement Lafarge Ltd.
OPERATOR: PLATEAU CONSTRUCTION LIMITED, Box 620, Kamloops.
WORK DONE: Siliceous volcanic tuff is quarried using an airtrac. The broken rock is loaded with a 966 Caterpillar loader into a Mack model R-685 dump truck and hauled to the crusher at the Canada Cement Lafarge cement plant. The company also diamond drilled two holes each 200 feet long. Production for the year was 21,750 tons.
REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 478.

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COAL

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GENERAL REVIEW OF COAL MINING AND EXPLORATION

By G. L. Bell

INTRODUCTION

The principal coal resources of the Province occur in comparatively narrow linear belts within the intermontane basins of the East Kootenay area and the inner foothills region of Northeastern British Columbia. The total prospective area is in the order of 1,900 square miles. These deposits, chiefly of Lower Cretaceous age, contain major *in situ* 'reserves' of medium and low volatile bituminous coal, generally suitable for production of metallurgical coke.

Rapid growth in world demand for coking coal during the late 1960's resulted in unprecedented development of new mine capacity in British Columbia, coupled with modernization of rail and port facilities to support large-scale operations. Significant growth of export shipments commenced in 1970. In 1972, two major mines, Kaiser Resources Ltd. and Fording Coal Limited, produced a combined total of about 9 million tons raw coal, chiefly from large open-pit operations. Residual clean coal product, totalling some 6.5 million tons, yielded a mine value of $66 million; 94 per cent of total output was exported to Japan.

Total coal exploration activity and expenditure declined in 1972. However, several detailed exploration and development feasibility programmes were continued during the year, resulting in establishment of important new mineable reserves. Approximately 1 million acres of coal licence lands were held at year end.

In addition to the major reserves of potential metallurgical coal, there are several comparatively small or localized lignite and bituminous thermal coal deposits within the Province. While there are no current developments in this respect, several of these deposits are likely to be investigated for power development purposes if costs of competing fuels increase substantially in future.

GEOLOGY AND MINING

Coal deposits of the Kootenay Formation in the Crowsnest Pass area and in the Gething and Gates Formations of Northeastern British Columbia occur in structurally complex foothills and mountainous terrain. Distribution and extent of the main stratigraphic units is controlled by extensive regional faults, *en echelon* folds of variable length and amplitude, and by erosional segregation in moderate to high relief terrain. Varying depositional patterns, resulting from coal accumulation in prograding deltaic and alluvial plain environments affect seam continuity, extent, and thickness in both a regional and local context. While physical conditions may be reasonably consistent in local areas, the spectrum of combined structural and stratigraphic effects is very broad, ranging from mildly flexed strata of relatively uniform characteristics to the steeply inclined, highly deformed, crushed, and friable deposits which are typical of the 'mountain' coals. Coking properties of the coal may be comparatively constant, or conversely, may vary between seams, or within a single seam.

The Kootenay coal measures which underlie the Fernie and Elk River basins attain a maximum thickness of about 2,500 feet. The formation contains 10 or more mineable seams, with aggregate coal thickness in excess of 150 feet. Of these, the Balmer and correlative seams which occur at the base of the sequence, may be up to 50 feet thick, and this factor, together with favourable strip-ratios in the currently developed mine areas, accounts for most of the reserves committed to date. Generally, the Kootenay coals possess good coking characteristics, and are low in sulphur. Raw ash content of 15 to 20 per cent is reduced by treatment to about 9 per cent.

Regional potential of the Gething and Gates Formations is less well defined. However, a combined total of at least seven mineable seams of medium and low volatile bituminous coking coal have been identified along much of the foothills belt southeastward from Peace River to the Alberta border. Prospective mine areas which have been most thoroughly investigated to date are situated within broadly synclinal, structurally less deformed blocks which appear amenable to underground mining. Other local areas, situated along thickened fold limbs, appear to offer attractive open-pit potential.

Mining experience in foothills conditions indicates that intensive pre-production assessment and accurate prediction of structural, stratigraphic, and terrain factors are essential requirements of a successful metallurgical coal operation. In particular, adequate reserve and quality control and their relationship to treatment plant design and production planning are especially important in meeting projected throughput and specifications.

Local deposits of lignite, sub-bituminous, and high volatile coals, mostly of Tertiary age, occur in widely scattered areas of British Columbia. Size and economic potential of these, including possible reserves in the former coal-mining areas of Vancouver Island, are small, although possibly some may be of value for local use, or for future on-site power development if costs of competing fuels increase substantially. A notable instance of the latter is the Hat Creek deposit, situated some 15 miles northwest of Ashcroft. Very limited exploration of this deposit indicates the occurrence of five major seams of high ash, low Btu lignite, with an aggregate thickness of some 2,000 feet. Although attitude of the seams is near vertical, considerable production could be achieved by large capacity surface mining equipment.

RESERVES

As at January 1, 1970, total coal resources of British Columbia on a geological *in situ* basis were estimated at some 59.5 billion short tons in all categories (measured, indicated, and inferred)* constituting about 50 per cent of the total for Canada. Of this, medium and low volatile bituminous coal accounts for some 58.1 billion tons, about 68 per cent of the Canadian total. Exploration and development work, particularly in Northeastern British Columbia, during the period 1970-1972 has augmented these estimates.

To keep these resource estimates in perspective, it should be noted that cumulative coal production of British Columbia from 1836 to 1972 (156 million tons) represents only 0.26 per cent of the 1970 total estimated coal, or that current raw coal production of 9 million tons annually to 2000 A.D. (requiring some 250 million tons) would account for only 0.42 per cent of the total. On the other hand, it must be emphasized that coal recoverable under existing technological and economic circumstances represents only a comparatively small fraction of the total *in situ* resource. A medium term study project was commenced during 1972 to coordinate all coal resource data, and to develop a selective and realistic assessment of reserves, emphasizing mining, economic, and utilization factors.

DEVELOPMENT

During the middle and late 1960's increased world demand for metallurgical coal and need for supply diversification by the Japanese steel industry, provided incentive for Western Canadian coal operators to undertake development of new and existing mines, and to finance or support modernization and construction of rail and port facilities required for large-scale coal-export operations.

The first significant production increase occurred during 1970 when Kaiser Resources Ltd. commenced shipment at a projected annual rate of 5 million long tons under a 15-year contract with Mitsubishi Corporation. Various technical problems in maintaining productivity and coal specifications, together with various rail and sea shipping disruptions, curtailed producton during the first 30 months of full operation; however, these difficulties had been mostly overcome by late 1972. Several contract re-negotiations relating to price, specifications, and volume occurred during this period; at December 31, 1972, established contract terms were for 5.04 million short tons annually, at $16.72 FOBT.

The second major development, by Fording Coal Limited, commenced production early in 1972. This is a combined dragline and truck-shovel operation based on two large open pits, with an ultimate design capacity of 3 million long tons clean coal annually. During the latter half of 1972, pro-rated annual output was approximately 1.5 million short tons, and it is anticipated that full production will be attained in the fiscal year 1973-1974.

*Latour, B. A. and Chrismas, L. P., Preliminary Estimate of Measured Coal Resources including Reassessment of Indicated and Inferred Resources in Western Canada, *Geol. Surv., Canada*, Paper 70-58.

COAL PRODUCTION AND DISTRIBUTION BY COLLIERIES, 1972 (adapted and modified from Table 8B, Annual Report of the Minister of Mines and Petroleum Resources)

	Raw Coal Production			Clean Coal Production		Coal Used		Coal Sales				Total Coal – Sold and Used		
	Surface	Underground	Total			Plant Use	Coke Making	Canada	Japan	Others	Total Sales	Amount	Total Value	Average Value
	Tons	Tons	Tons	Tons	%	Tons	Tons	Tons	Tons	Tons	Tons	Tons	$	$ per Ton
SOUTHEAST BRITISH COLUMBIA														
Coleman Collieries Ltd. (Tent Mountain Colliery)	74,178	–	74,178	58,213	78.5	–	–	–	58,213	–	58,213	58,213	616,464	10.59
Crows Nest Industries Ltd.* (Line Creek Test Pit)	19,593	–	19,593	12,735	65.0	12,735	–	–	–	–	–	12,735	127,350†	10.00
Fording Coal Limited	2,659,418	–	2,659,418	1,141,452	42.9	–	–	–	1,100,316	302	1,100,618	1,100,618	8,254,638	7.50
Kaiser Resources Ltd.	5,297,489	1,009,796	6,307,285	5,352,590	84.9	5,228	203,820	70,781	4,536,499	38,876	4,646,156	4,855,204	57,037,938	11.75
NORTHERN BRITISH COLUMBIA														
Coalition Mining Ltd.*	–	12,000	12,000	12,000	–	–	–	–	–	11,687	11,687	11,687	116,870	10.00
Bulkley Valley Colliery Ltd.	–	476	476	476	–	–	–	476	–	–	476	476	4,300	9.03
TOTALS, 1972	8,050,678	1,022,272	9,072,950	6,577,466	–	17,963	203,820	71,257	5,695,028	50,865	5,817,150	6,038,933	66,157,560	10.96
Per Cent and Average	88.7%	11.3%	100.0%	72.5%	–	0.3%	3.4%	1.2%	94.3%	0.8%	96.3%	100.0%	–	–
TOTALS, 1971	–	–	5,602,000	4,637,012	82.8	7,207	212,036	74,367	4,063,778	207,855	3,346,000	4,565,242	45,801,936	10.03
Change 1972/1971	–	–	+3,470,950	+1,940,454	–	+10,756	–8,215	–3,110	+1,631,250	–156,990	+2,471,150	+1,473,691	+20,355,624	+0.93
Per Cent Change 1972/1971	–	–	+62.0%	+41.9%	–	+149.2%	–3.9%	–4.2%	+40.1%	–75.5%	+73.9%	+32.3%	+44.4%	+9.3%

*Metallurgical coal for washing and coking tests.

†Estimated

Widespread exploration during the 1969-1971 period established a number of important new coal deposits in both the East Kootenay area and in Northeastern British Columbia. Overall exploration activity declined during 1972, reflecting a normal process of consolidation following property valuation, combined with a flattening of demand for new production capacity resulting from temporary cutback in steel industry requirements. However, several advanced exploration and development feasibility programmes were continued during the year. Notable among these were operations by Kaiser Resources Ltd. and Sage Creek Coal Limited in the Fernie basin, and by Coalition Mining Limited and Denison Mines Limited in the Sukunka River-Quintette Mountain area of Northeastern British Columbia.

Value of approved exploration work for 1972 totalled some $1.9 million, compared to $5.3 million for 1971. Nevertheless, at December 31, 1972, a total of 1,759 coal licences, covering approximately 1 million acres, continued to be held by some 35 companies or partnerships.

PRODUCTION

Production statistics, modified to indicate average and percentage comparisons, are shown in Table 1. Several of the more significant factors are as follows:

1. Total 1972 raw coal production of some 9.1 million tons and clean coal output of 6.6 million tons represented increases of 62 per cent and 42 per cent respectively over 1971, which in itself had established all-time records.
2. Virtually all coal was produced from two mines, and about 90 per cent of total output was derived from surface-mining operations.
3. Clean coal output averaged about 70 per cent of total raw coal mined.
4. Minehead value of 1972 coal sales, amounting to some $66 million, represented an increase of some $20 million, or 44 per cent over 1971. Mostly, this resulted from an increase in output, combined with an average price increase of about 9 per cent.
5. About 94 per cent of total coal output was exported to Japan. Domestic coke production, accounting for some 3 per cent of output, represented the second largest market.

REPORTS ON COAL MINES

EAST KOOTENAY INSPECTION DISTRICT

By R. W. Lewis and G. L. Bell

Total coal production from the East Kootenay District during 1972 was 6,564,990 short tons of clean coal, an increase of almost two million tons over the previous year. Kaiser Resources Ltd. and Fording Coal Limited produced 5,352,590 tons and 1,141,452 tons respectively. The remaining small tonnage was produced by Coleman Collieries Limited from the British Columbia side of the Tent Mountain open pit (58,213 tons) and by Crows Nest Industries Limited from their Line Creek prospect. The latter, a shipment

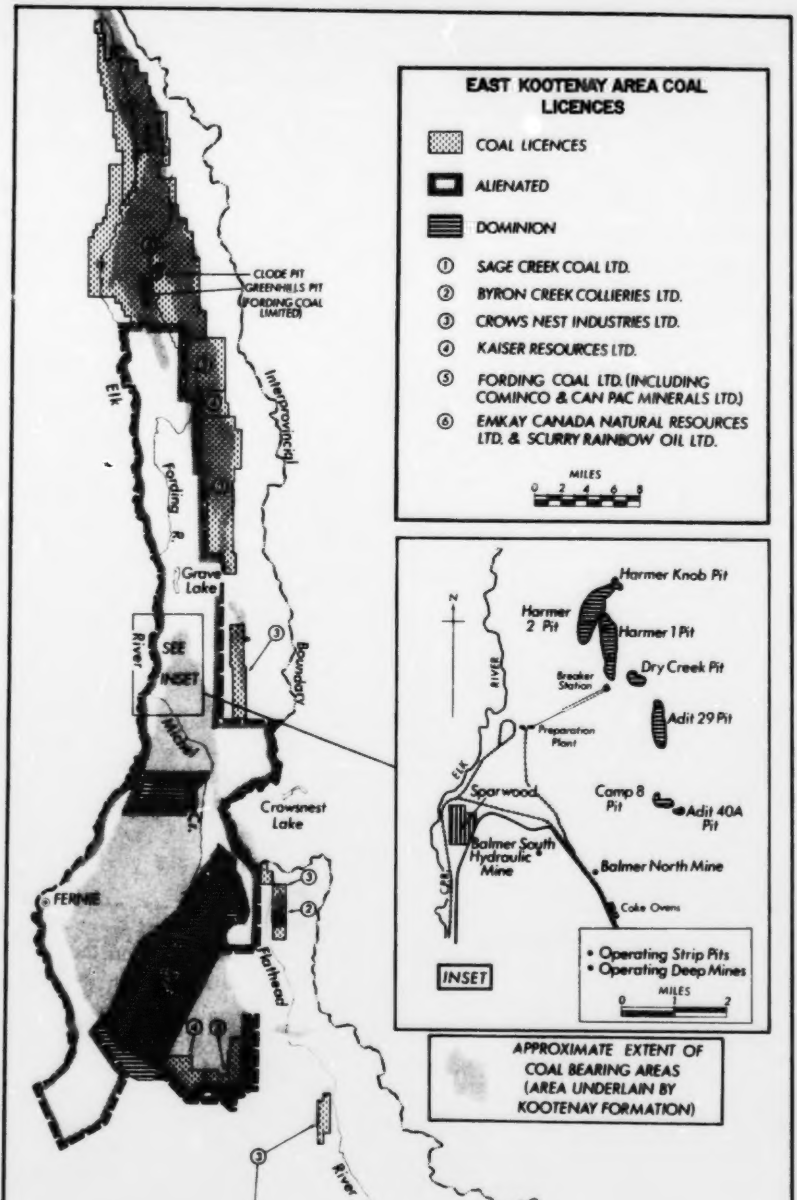
EAST KOOTENAY AREA COAL LICENCES
COAL LICENCES
ALIENATED
DOMINION
① SAGE CREEK COAL LTD.
② BYRON CREEK COLLIERIES LTD.
③ CROWS NEST INDUSTRIES LTD.
④ KAISER RESOURCES LTD.
⑤ FORDING COAL LTD. (INCLUDING COMINCO & CAN PAC MINERALS LTD.)
⑥ EMKAY CANADA NATURAL RESOURCES LTD. & SCURRY RAINBOW OIL LTD.
MILES
0 2 4 6 8
CLODE PIT
GREENHILLS PIT
(FORDING COAL LIMITED)
Elk
Fording R.
Interprovincial
Boundary
Grave Lake
River
SEE INSET
Michel
Cr.
Crowsnest Lake
FERNIE
Flathead
River
Harmer Knob Pit
Harmer 2 Pit
Harmer 1 Pit
Dry Creek Pit
Breaker Station
Adit 29 Pit
Preparation Plant
RIVER
ELK
Sparwood
Camp 8 Pit
Adit 40A Pit
Balmer South Hydraulic Mine
Balmer North Mine
Coke Ovens
C.P.R.
N
• Operating Strip Pits
• Operating Deep Mines
MILES
0 1 2
INSET
APPROXIMATE EXTENT OF COAL BEARING AREAS (AREA UNDERLAIN BY KOOTENAY FORMATION)

Figure 73. Fernie Basin: geology and coal licences.

yielding 12,735 tons of clean coal from Crows Nest Industries Limited's No. 10 test pit, was trucked to Coleman Collieries Limited's preparation plant for testing purposes.

Exploration work conducted in the district during 1972 was less than in the immediately preceding years. However, although the two major producers concentrated on detailed development geology and quality control programmes in extension of their open-pit reserves, intensive exploration mapping, drilling, and trenching were undertaken by Rio Tinto Canadian Exploration Limited in the lower Flathead Valley, and by Kaiser Resources Ltd. in evaluation of Crows Nest Industries Limited's lands in the easterly and southern parts of the Fernie coal basin. Considerable exploration drilling and limited trenching were conducted by Byron Creek Collieries Limited with a view to assessment of possible open-pit reserves in the Coal Mountain deposit near Corbin.

Kaiser Resources Ltd. continued to augment production in the Harmer Ridge open-pit complex, resulting in an increase of more than 500,000 tons compared with the previous year. The Michel Colliery, for the first time on record, produced in excess of one million tons of clean coal during 1972. Colliery production was from two underground mines, extraction from both being limited to mining of the No. 10 (Balmer) seam only. Almost all the coal produced, both at the Harmer Ridge open pit and at the Michel Colliery, was treated in the Elkview preparation plant, with only sufficient coal being directed to the Michel plant to keep the by-product plant in operation.

At Fording Coal Limited's operation, mining activities in the Clode Creek and the 'Repeat 4' open pit, both of which had commenced in the previous year, continued throughout 1972. Following assembly and testing of the 60-yard Marion dragline, the Greenhills open pit commenced operation in January. The new preparation plant, coal dryer, and load-out facilities for unit-train shipments were also brought into operation in the early part of 1972.

SAGE CREEK COAL LIMITED (No. 162, Fig. A)

LOCATION: Lat. 49° 06' Long. 114° 34' (82G/2E)
In the lower Flathead Valley; property is situated on Cabin Creek, approximately 2 miles upstream from its junction with the Flathead River.

LICENCES: CL Nos. 374 to 411, 986 to 989, 1880 to 1886 held by Sage Creek Coal Limited; CL Nos. 603 to 605 held by Crows Nest Industries Limited.

ACCESS: Off Highway 3 at Morrissey, approximately 44 miles southeast via Lodgepole forest access road and Flathead Valley road.

OPERATOR: RIO TINTO CANADIAN EXPLORATION LIMITED, 120 Adelaide Street West, Toronto, Ont.; R. A. Benkis, Geologist, Special Projects.

DESCRIPTION:

Kootenay Formation rocks underlie a comparatively narrow arcuate east-dipping outcrop belt along the easterly side of the Howell Creek structure, and are terminated on the northeast by the Harvey fault. Locally, as many as five seams of mineable thickness occur throughout the Kootenay sequence. Within the subject prospect, their structural attitude indicates a comparatively uniform dip-slope profile amenable to strip-mine operation. To the south of Cabin Creek, structural continuity is broken by several closely spaced normal faults of relatively small displacement, which, however, may not seriously affect extraction by open-pit methods.

WORK DONE:

Surveys were made on the surface and topographic maps prepared on a scale of 1 inch equals 400 feet. Surface geological mapping at a scale of 1 inch equals 400 feet was completed on CL Nos. 374, 375, 392, 393, 396, 988, 989, and 603 to 605. Underground geological mapping on a scale of 1 inch equals 5 feet detailed exploration on CL Nos. 392 and 603.

During 1972, Rio Tinto Canadian Exploration Limited drove four adits into the south end of the North Hill. These involved a total excavation of 1,084 feet as follows: Seam 2, 126 feet; Seams 4A and 4B, 334 feet; Seam 5, 384 feet; and Seam 5 (HW), 240 feet.

Five 8-ton bulk samples were extracted from the adits under direct supervision of the Federal Department of Energy, Mines, and Resources, Edmonton, Alberta.

Contract survey crews were used to establish field exploration grids and control for map compilation. A total of 12,000 feet of survey and grid control line was cut in the area.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 486.

BYRON CREEK COLLIERIES LIMITED (No. 161, Fig. A)

LOCATION: Lat. 49° 30′ Long. 114° 40′ (82G/10E)
On Coal Mountain, extending approximately 3 miles south of Corbin.
LICENCES: Lots 6997 and 6999 (private coal lands).
ACCESS: Off Highway 3 at McGillivray, approximately 15 miles southeast by fair gravel road.
OWNER: BYRON CREEK COLLIERIES LIMITED, Box 270, Blairmore, Alta.; E. Fabro, Vice-President and General Manager; V. H. Johnson, Consulting Geologist.

DESCRIPTION:

Kootenay Formation coal seams occur in complex multiple synclines controlled by folded reverse faults and imbricate slices. There are at least two seams of mineable thickness which are commonly intensely deformed and abnormally thickened. Underground mining, which was undertaken during the period 1908 to 1935 was generally unsuccessful because of structural problems, and susceptibility of the coal to spontaneous combustion. It appears however that considerable tonnage of open-pit 'thermal' coal might be developed within parts of the deposit.

WORK DONE:

A total length of 4.5 miles of old roadway was completely reconstructed, and an exploration campsite was established near the old Corbin townsite.

The 1972 exploration programme concentrated on drilling and sampling of the main seam, along and across general strike of the deposit. A total of 4,000 feet of diamond drilling and 3,100 feet of reverse circulation rotary drilling was completed. Channel

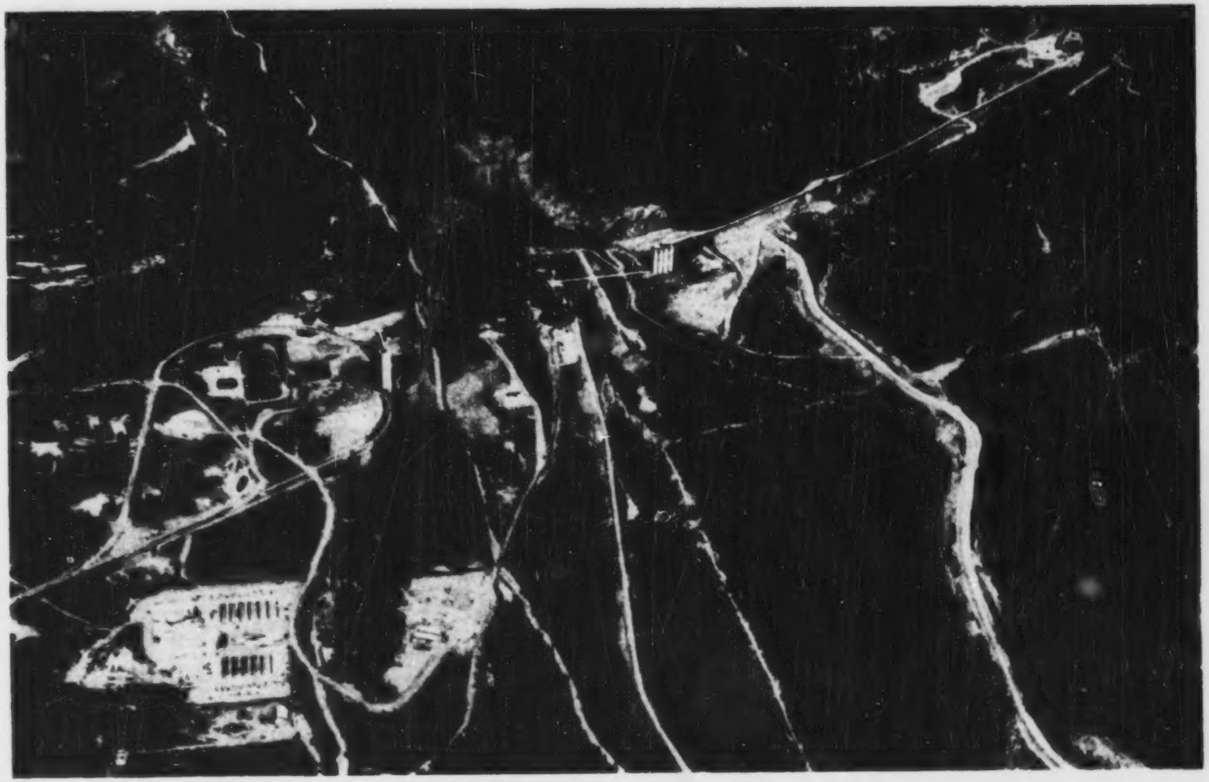

Plate XXII. Sparwood: aerial view northwards showing Kaiser Resources Ltd.'s Elkview preparation plant. Mine conveyor system at upper right, railway load out from coal storage silos at left. (*Courtesy Kaiser Resources Ltd.*)

sampling of the seam was employed to supplement drill-hole sampling results.

REFERENCE: *Geol. Surv., Canada,* Map 4-1965.

KAISER RESOURCES LTD. (No. 164, Fig. A)

LOCATION:	Lat. 49° 45′	Long. 114° 45′	(82G/10, 15)
	Michel and Harmer Ridge areas, adjacent to Highway 3.		
LICENCES:	Lots 4588 and 4589 (private coal lands); CL Nos. 160 to 263, 500 to 506, and 564 to 571.		
ACCESS:	Off Highway 3 at Sparwood.		
OWNER:	KAISER RESOURCES LTD., Box 2000, Sparwood; R. W. MacPhail, Vice-President and General Manager; L. H. Hunter, Underground Mining; D. E. Bowdie, Superintendent, Maintenance; L. Lindsay, Superintendent, Elkview Plant; G. H. Lancaster, Superintendent, Michel Surface.		

DESCRIPTION:

Kaiser Resources Ltd.'s lands contain the major coal reserves of the Fernie Basin. The Kootenay Formation, which attains a thickness of about 2,200 feet, underlies the entire basin and outcrops along a prominent peripheral escarpment below Blairmore conglomerates, terminating northward in a broadly synclinal pitch culmination in the Michel Creek area. Here, the Kootenay Formation contains up to 10 mineable seams, ranging in thickness from 5 feet to 55 feet, with aggregate coal thickness in excess of 150 feet.

Currently, only the north end of the basin is under active development. This includes the Harmer Ridge open-pit complex, the South Balmer hydraulic mine, and the North Balmer underground mine. All extraction is from the No. 10 (Balmer) seam, which averages about 50 feet in thickness.

Development in the Harmer Ridge area is in a broad, mildly deformed upper thrust plate on the east limb of the syncline. Dip of the Balmer seam within the pit flattens westward and southward from about 20 degrees. Minor fault repetition occurs within the pit, and substantial displacement along the West Harmer normal fault limits the westerly extent of current pit operations.

The 'main block' reserves of the Adit 29 and Camp 8 area have a similar configuration, whereas those of the Camp 40 area to the east are in the underlying plate of Kootenay Formation, and the sequence is generally more deformed, with multiple repetition by low-angle thrust faults.

The South Balmer hydraulic mine is situated at the north end of Sparwood Ridge, in the west limb of the syncline. Within the hydraulic development area, which extends up-dip from the previous underground workings, dip of the Balmer seam is 35 degrees to 45 degrees northeast, with maximum cover of about 800 feet.

WORK DONE:

During 1972, the company continued to mine the open pits in Harmer Ridge and two underground mines at Michel. One of the latter used the hydraulic method. The raw coal was processed at the Elkview preparation plant and loaded there into unit trains. Coke preparation was done at the Michel plant. Work continued in reclamation, prospecting, and exploration.

OPEN-PIT MINING: J. E. Korski, General Superintendent of Mining; L. M. Dwarkin, Chief Mine Engineer; J. B. Murphy, Chief Geologist.

Open-pit mining was carried on in the general area known as Harmer Ridge. Individual pits and their production are as follows:

Pit	Rock Stripped broken cubic yards	Metallurgical Coal Produced tons	Steam Coal Produced tons
Harmer 1	7,157,506	3,194,403	352,550
Harmer Lobe	1,415,330	——	37,572
Harmer 2	11,579,863	22,038	8,767
Adit 29	10,498,298	1,360,367	35,489
Camp 8	66,272	642,130	....
Adit 40A	4,046,895	63,230	8,213
Totals	34,764,164	5,282,168	442,591

In Harmer Lobe, and in part of the Harmer 1 pit, stripping was done by Page dragline; the remaining pits, including part of Harmer 1, were worked by truck-shovel method only.

Fourteen thousand tons of explosives was used to break the rock for stripping.

One 60-R drill was added during the year. Principal equipment used for stripping was: one 54-yard dragline; four 25-yard shovels; two 15-yard shovels; two 10-yard shovels; five 60-R drills; one 45-R drill; seventeen 200-ton trucks; twenty-three 100-ton trucks; four front-end loaders; nineteen dozers.

DEVELOPMENT AND EXPLORATION GEOLOGY: Detailed pit mapping, quality control, and reserve forecasting procedures in the Harmer Ridge development area were augmented by a longhole drilling programme in which 17 holes, totalling 6,101 feet, were drilled during the year. Detailed exploration and limited drilling were also done in the Michel area to locate a new mine portal.

Exploration programme in gross reserve assessment of other parts of the coal basin continued during 1972, with work in the Flathead, Marten Creek, Tent Mountain, and Mount Taylor areas. Prospect mapping and seam sampling of adits and trenches were extensive. A summary of physical work completed during 1972 is as follows: 41.1 miles of road constructed; 2 miles of seam tracing; 3.9 miles of seam trenching; 13 prospect adits totalling 1,777 feet of underground workings; and 6,505 feet of exploratory drilling (Michel and Harmer operations).

Slash disposal and tidying were done on a 4-square-mile area of Hosmer Ridge and a 1-square-mile area along the Greenhills access road in the Elk Valley.

RECLAMATION AND ENVIRONMENTAL CONTROL: Field operations undertaken this year are as follows: Elkview A and B Lagoons, 25 acres, seeding and planting;

Michel refuse dump, 17 acres, resloping, seeding, and planting; Elkview conveyor area, 12 acres, seeding and planting; Baldy pits, 35 acres, resloping, seeding, and planting; 7A and 7B pits, 33 acres, resloping, seeding, and planting; McGillivray pit, 26 acres, resloping; Hydraulic mine dewatering plant, 3 acres, planting; road banks, 120 acres, hydroseeding; Elkview A refuse area, 12 acres, planting.

A research programme was started to test some 50 species and varieties of grass and herbs. A second research programme tested tree survival and percentage ground cover of grass to relate these to various site factors.

Seeds of 15 species of trees and shrubs were collected and are stored for future use.

Monitoring programmes were established on the various emissions and effluents associated with the company operations.

Harmer Dam proved successful in stopping pollution of Harmer Creek and in 1972 Erickson Dam was completed to do the same for Erickson Creek. These two dams protect all the active spoil dumps on Harmer Ridge.

A spray system was installed to suppress dust on the coal trains and proved fairly effective.

ELKVIEW PREPARATION PLANT: L. Lindsay, Superintendent.

Raw coal from the open pits was delivered by trucks to the breaker station, where it was reduced to a 4 by 0-inch size range. The coal was then conveyed through a mile long tunnel to the four raw coal silos having a total capacity of 8,000 tons. The coal was then conveyed into the coal preparation plant where it was separated for treatment into four different size ranges. The 4 by 3/8-inch coal was treated in a heavy medium vessel, the 3/8-inch by 28-mesh coal was treated in heavy media cyclones, the 28 by 100-mesh coal was treated in hydrocyclones, and the minus 100-mesh coal was treated by flotation.

The clean coal in the size range 3/8 by 0-inch was dried in a fluid-bed thermal coal dryer and added to the clean, coarse coal for storage in the clean coal silos. The unit trains were loaded as they were hauled through the loading station at the base of the clean coal silos.

Coarse refuse from the plant was hauled by scrapers to the spoil area, where it was layered and compacted. The minus 28-mesh tailings were fed into tailings impoundments from where the water, once clarified, returns to the plant for reuse.

MICHEL COLLIERY: A.W.T. Grimley, Mine Manager; J. Anderson, Superintendent, Hydraulic Mine; W. Davey, Superintendent, Balmer North Mine; H. Eberts, Safety Co-Ordinator.

The colliery is situated at Michel, on the Crowsnest Branch of the Canadian Pacific Railway, 24 miles east of Fernie. The colliery comprises two mines, developed in the No. 10 (Balmer) seam.

Air is supplied to each mine by separate ventilation fans.

The chief motive power used is electricity. The combined underground operation of the colliery is under the supervision of two overmen, two foremen, and fifteen firebosses.

BALMER NORTH MINE: This mine is situated on the north side of the valley. The seam is approximately 50 feet thick, dips 20 degrees in a southwesterly direction, and contains good quality low volatile coking coal.

A panel system is used, and the main rooms are driven on the strike of the seam at 10 degrees. The coal is mined by continuous miners and hauled by shuttlecars to a transfer point onto 36-inch belts. The roadways are driven in the top portion of the seam, and roof bolts are used for support. In poor ground three-piece timber sets are employed. Coal extraction is being carried out by continuous miners, extracting the bottom coal off the driven roadways. Approximately 30 feet of the bottom coal is taken out by this method. When extraction is completed in each panel, the panel is sealed with concrete stoppings.

There are three continuous miners, three shuttlecars, and nine 36-inch belt units used to cut and haul the coal to the surface. Supplies are hauled into the mine by the use of two battery-operated vehicles.

Compressed air is supplied to the mine from the surface to run the stoping machines for roof bolting, and also to run air-driven pumps pumping water to the surface.

There are 78 men employed producing an average of 1,400 tons per day.

Ventilation is by an electrically driven fan which has a Joy H108-65D 400-horsepower electric motor, a 600-horsepower diesel motor as a standby, exhausting approximately 370,000 cubic feet per minute with a 5.4-inch water gauge.

During the winter months, two Joy H60-36V 100-horsepower electric fans, with 10,000,000 Btu heaters, are run in the No. 1 and No. 2 tunnels to prevent freezing.

SOUTH BALMER HYDRAULIC MINE: The mine is situated on the south side of Michel Creek. The Balmer seam here is approximately 50 feet thick, dips approximately 45 degrees northeast, and yields a low volatile good quality coking product.

The system of working this seam is hydraulic panel, and the main entries and rooms are driven at approximately 7 per cent to the rise.

The development is by continuous miners, shuttlecars, and 30-inch belts. The sublevels off the main entries are driven using continuous miners and shuttlecars loading into the flume. The roadways are driven in the lower portion of the seam, and a three-piece yielding steel arch is used for roof support.

Coal extraction from the pillars is by high pressure water, using monitors to cut the coal. The coal is washed onto a feeder breaker, where large lumps are broken and loaded into flumes, where it is flumed by gravity to the surface and to the dewatering plant.

There are two monitors and two feeder breakers; one continuous miner, one mobile loader, and one shuttlecar are used to cut coal in the extraction section.

There is one continuous miner, one mobile loader, two shuttlecars, and six 30-inch belt units used to cut and haul coal to the surface in the developing section. Supplies are hauled into the mine by two diesel-powered Hunslet vehicles.

This mine has a daily output of 2,887 tons, employing 115 men.

The mine is ventilated by a Joy H60-36V 100-horsepower electric fan, producing approximately 125,000 cubic feet per minute with a 1.9-inch water gauge.

This fan has a 10,000,000 Btu heater which is used during the winter months. A Joy H60-36V 100-horsepower electric motor fan is on standby. To dilute the coal dust, 2,331 tons of limestone dust was used for application to the roadways of the two mines; 555 tons of limestone dust was used in both mines at the seals.

Monthly mine-dust samples were collected from both mines and analysed. All the samples were above the minimum requirements of incombustible content.

Monthly examinations were made by the miners inspection committee at both underground and surface operations. Regular monthly meetings were held at the company office by the inspection and safety committees.

All report books kept at the mines, in accordance with the *Coal Mines Regulation Act,* were examined and found in order.

MICHEL BY-PRODUCT PLANT: G. Lancaster, Superintendent; T. Melville, Foreman. There were 131,646 tons of coke and 675,483 gallons of tar produced.

MICHEL PREPARATION PLANT: G. Lancaster, Superindentent; L. DeLuca, Foreman. Coal is hauled to the plant by truck from the mine, and is dumped into silos, where it is loaded onto a feeder belt conveyor, that transports the coal to the plant where it is sized and screened. The minus ¼-inch is diverted to the storage bins for use in the by-products plant. The above ¼-inch is loaded for commercial use, or stockpiled for transportation to the Elkview plant. Coal put through the plant during the year amounted to 296,948 tons.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 486.

CROWS NEST INDUSTRIES LIMITED (No. 160, Fig. A)

LOCATION: Lat. 49° 56' Long. 114° 46' (82G/15)
On ridge west of Line Creek, a tributary of Fording River.
LICENCES: CL Nos. 294 and 295.
ACCESS: By 17 miles of logging road, north of Natal.
OWNER: CROWS NEST INDUSTRIES LIMITED, Box 250 Fernie; J. J. Crabb, Vice-President, Exploration.

DESCRIPTION:

Up to 11 lower Kootenay Formation coal seams of mineable thickness underlie Line Creek ridge, which forms the west limb of the Fording River syncline in this area. General configuration is a comparatively simple, progressively flattening dip-slope deposit; however, seam deformation and thickening occur toward the easterly side in the vicinity of the synclinal axis, and the section is apparently fault-terminated along the west side of Line Creek.

WORK DONE:

Work in test pit No. 10, located on No. 8 seam, was commenced in December 1971. On completion of overburden removal, coal loading and hauling commenced January 10, 1972. This work continued until the end of February, by which time 19,593 tons of coal

Plate XXIIIA. Line Creek Ridge: view northwards, showing Lower Kootenay coal seams overlying basal sandstone unit (Moose Mountain member) at left. Average dip is 45 degrees east. Crows Nest Industries Limited's test adit at right.

Plate XXIIIB. Line Creek: Kootenay coal measures exposed in upper part of section on east side of Line Creek Ridge. Dip flattens eastward into regional Fording River syncline.

had been delivered to the coal preparation plant of Coleman Collieries Limited, Coleman, Alberta. The contract was terminated at this tonnage and no further coal was shipped from the property during the year.

On June 27, when conditions permitted, work commenced on reclamation of the test pit area and also on a previously worked pit referred to as test pit No. 9. Roads were cleared and ditched. Overburden was pushed back into the pits, insofar as this was feasible. Fallen trees were cut and limbed in accordance with the Forest Branch directives. Spoil banks were contoured where necessary, and settling ponds were constructed to preclude direct runoff from the mine area into Line Creek. Reseeding of the reclaimed area is planned for the spring of 1973.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 491.

FORDING COAL LIMITED (No. 163, Fig. A)

LOCATION: Lat. 50° 12' Long. 114° 52' (82J/2W)
The property is situated in the upper Fording Valley, approximately 30 miles north of Sparwood.

LICENCES: Seventy-five coal licences owned by Fording Coal Limited and Canpac Minerals Limited.

ACCESS: Total of 42 miles of road north of Natal Junction on Highway 3, via 23 miles along the Elk Valley to Elkford, then 7 miles easterly to the Fording Valley, thence 12 miles north along the upper Fording Valley. Canadian Pacific Railway spurline from Sparwood Junction, 34 miles.

OWNERS: Fording Coal Limited, Canpac Minerals Limited, and Cominco Ltd.

OPERATOR: FORDING COAL LIMITED, Box 108, Sparwood (managed by Cominco Ltd., Trail); R. M. Porter, President; O. I. Johnson, Manager; J. B. Donald, Superintendent Mining; G. W. Lee, Superintendent, Shops and Services; R. W. Zeindler, Production Superintendent; G. Lokhorst, Mine Engineer; A. C. Taplin, Mine Geologist.

DESCRIPTION:

Kootenay Formation coal seams occur in two broad north-trending synclines, situated one on either side of the Fording River, which is the locus of a regional west-dipping normal fault. Ten seams of significant thickness are present in the currently developed mine areas located on the east limb of the Greenhills syncline (Greenhills pit) and west limb of the Eagle Mountain syncline (Clode pit). The latter structure is complicated by a flat-lying thrust fault in the lower slope of Turnbull Mountain, resulting in repetition of the lowest seam ('Repeat 4' pit). Plantsite elevation in the valley bottom is 5,500 feet, with coal outcrop in the Eagle Mountain section ranging up to 7,300 feet.

WORK DONE:

Construction of the processing plant and related facilities was completed by Kootenay Engineering Ltd., a wholly owned Cominco subsidiary, in late February. Production from the Clode truck-shovel pit which commenced in late 1971 continued throughout the year, and the Greenhills dragline pit commenced operation in January 1972. Development drilling and reserve assessment work continued throughout the year.

EXPLORATION AND DEVELOPMENT: The 1972 geological work concentrated on detailing seam configuration and coal quality data in areas adjacent to the operating pits.

Forty rotary holes, totalling 3,659 feet, and 182 auger sample holes, totalling 4,510 feet, were drilled by Fording crews. Of the former, 35 holes were drilled in the Greenhills pit area to detail seam geometry, results indicating moderate flattening of dip in B seam, thereby increasing in place reserves by approximately 500,000 tons. Remaining rotary holes were drilled in the 'Repeat 4' block on the lower slope of Turnbull Mountain with a view to planning a potential open pit in this area.

Work in the Clode pit area consisted mainly of 128 auger sample holes drilled on the seam and between benches, primarily to secure quality data for Nos. 11 and 9 seams. This assessment was augmented by bulk channel sampling for washability testing.

MINE PRODUCTION: Production from the Clode truck-shovel pit, which commenced in late 1971, continued throughout the year. Following assembly and testing of the 60-cubic-yard Marion dragline, production from the Greenhills pit commenced in mid-January 1972.

The number of employees increased from 86 staff and 333 general on December 31, 1972, to 111 staff and 501 general on December 31, 1972.

All pre-production work was completed by year end 1971. However, 4,600 feet of temporary haul road was constructed to bypass a slide that blocked the existing Clode pit haul road. In addition 1,400 feet of bypass haul road was constructed to shorten the temporary Clode pit road.

On May 27, approximately 200,000 cubic yards of waste rock slid down the west face of the Clode pit waste dump and blocked the haul road. This slide damaged two scrapers, parked at the edge of the haul road, but there were no injuries in the slide. A bypass road was constructed (mentioned above) around the slide. This slide was believed to be a result of dumping material on a foundation slope which was steeper than the natural angle of internal friction of the base material. The result was a large failure of the foundation material. The consulting firm of Golder Brawner and Associates has confirmed that the possibility of another large foundation failure is extremely remote because the present dump is toed on a flatter foundation slope well below the angle of internal friction of the foundation material.

CLODE CREEK PIT: Mining had commenced down to the 6500 bench in the pit by year end, producing the following statistics: waste, 8,026,871 cubic yards; metallurgical coal, 965,826 long tons raw coal; oxidized coal, 2,070 long tons raw coal.

REPEAT 4 PIT: Mining activity continued intermittently in the 'Repeat 4' pit. Quantities excavated were as follows: waste, 393,717 cubic yards; metallurgical coal, 298,859 long tons raw coal; oxidized coal, nil.

GREENHILLS DRAGLINE PIT: Production from the Greenhills pit commenced early in 1972 producing the following: waste, 3,036,996 cubic yards; till, 1,764,623 cubic yards; rehandle, 1,440,420 cubic yards; metallurgical coal, 1,312,441 long tons raw coal; oxidized coal, nil.

SUMMARY OF MINE QUANTITIES: *Material quantities:* waste, 11,457,584 cubic yards; waste, 1,764,623 cubic yards; rehandle, 1,440,420 cubic yards; metallurgical coal, 2,577,126 long tons raw coal; oxidized coal, 2,070 long tons raw coal. *Blasting agents consumed:* bulk AN/FO, 7,567,538 pounds; bulk slurry, 3,024,189 pounds; T-3 Hydromex, 356,950 pounds; power frac, 1,550 pounds; Giant Gel, 10,220 pounds.

PROCESSING: Coal from the open-pit operations is reduced in size to minus 5 inches at the coal-breaking station. The raw coal in the 5-inch – 3/8-inch size range is washed in a Tromp dense medium bath, with secondary treatment in a second Tromp bath. Coal in the size range of minus 3/8-inch to plus 28 mesh is treated in dense medium cyclones. The minus 28 mesh to zero size range coal is treated by froth flotation, with the clean coal being recovered by filtration and the fine tailings being discharged into the tailings impoundment. The fine coal is further treated in a McNally-Pittsberg thermal coal dryer.

Raw coal from the previously commissioned breaking and stacking equipment started to move into the washing plant in February. A gradual build-up of production rates has resulted from overcoming a number of equipment deficiencies and mechanical and electrical difficulties, and by improving the experience of the operating and maintenance crews. At year end about 80 per cent of rated capacity had been achieved.

Production and shipment for the year were as follows:* raw coal treated, 1,909,424 long tons; clean coal produced, 1,009,663 long tons; cleaned coal shipped by rail, 982,425 long tons. Average analysis of product (air dried) was: ash, 8.5 per cent; volatile, 23,2 per cent; fixed carbon, 67.5 per cent; sulphur, 0.41 per cent; FSI, 7.

PROPERTY AND TOWNSITE: Most of the construction work was completed before the end of 1971. Projects carried over into 1972 were as follows:

MINE: The following equipment was commissioned during the year: one PH 2100 BL 15-cubic-yard shovel; one Dart D600 26-cubic-yard front-end loader for the processing plant; one Caterpillar 16 road grader.

PROCESS PLANT: The following was carried over from 1971: wash plant, completed and commissioned; dryer, completed and commissioned; clean coal storage, completed and commissioned; tailings pond and water reclaim, commissioned; raise tailings dyke, 3 feet.

SERVICES: Built railroad overpass; completed fuel and lube storage.

TOWNSITE: During the year 1972, 172 homes were completed and occupied. The water and sewage system in the village was completed. Single men's accommodation is available for 336 men. Married accommodations are as follows: mobile homes, 133 private and 5 company; detached homes, 172. Married accommodation in Elkford is still critical. At year end, active consideration was being given to constructing some apartments in Elkford, developing more serviced lots, and building detached homes and a commercial development.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.,* G.E.M., 1971, p. 494.

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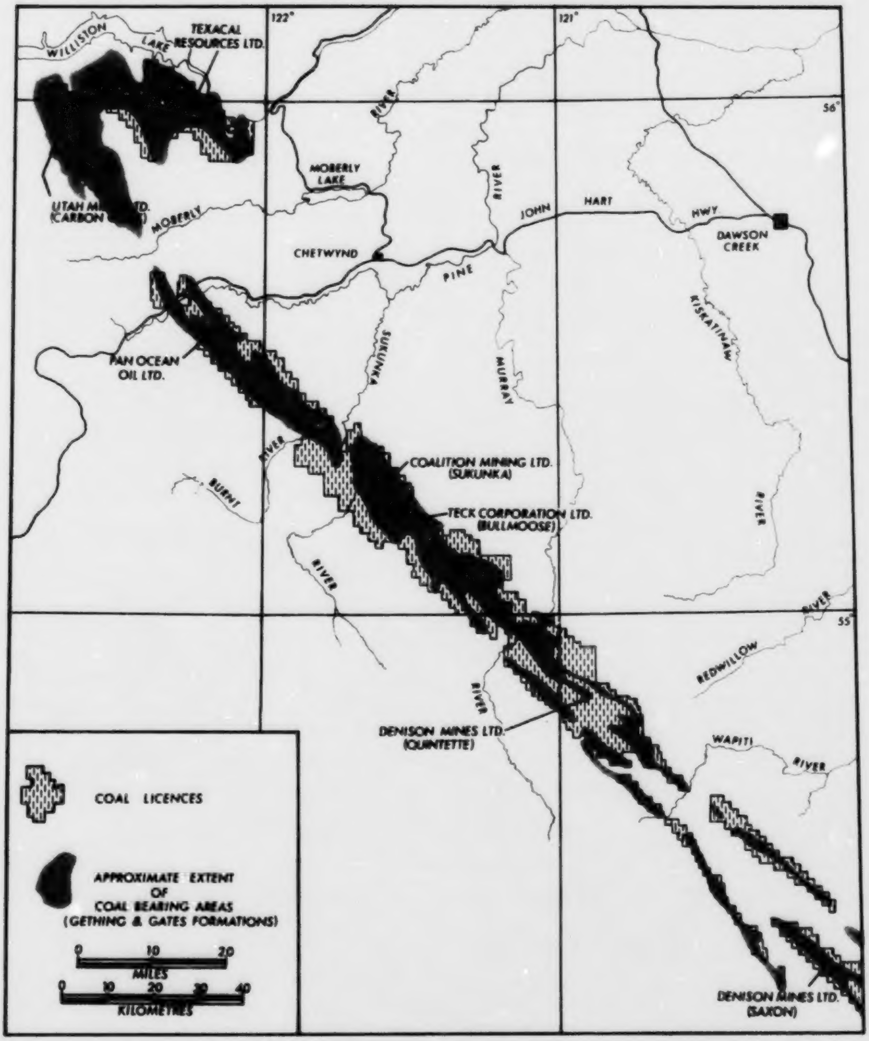
*Plant figures vary somewhat from official statistics due to inventory adjustments, etc.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WILLISTON LAKE
122°
121°
56°
55°
MOBERLY LAKE
RIVER
UTAH MI TD. (CARBON)
MOBERLY
CHETWYND
JOHN HART HWY
DAWSON CREEK
PINE
RIVER
PAN OCEAN OIL LTD.
SUKUNKA
MURRAY
KISKATINAW
RIVER
BURNT RIVER
COALITION MINING LTD. (SUKUNKA)
TECK CORPORATION LTD. (BULLMOOSE)
RIVER
REDWILLOW RIVER
RIVER
DENISON MINES LTD. (QUINTETTE)
WAPITI RIVER
DENISON MINES LTD. (SAXON)
COAL LICENCES
APPROXIMATE EXTENT OF COAL BEARING AREAS (GETHING & GATES FORMATIONS)
0 10 20
MILES
0 10 20 30 40
KILOMETRES

Figure 74. Foothills Belt, Northeastern British Columbia: geology and coal licences.

NORTHERN INSPECTION DISTRICT

By G. L. Bell and T. M. Waterland, except as noted

DENISON MINES LIMITED (SAXON PROJECT) (No. 167, Fig. D)

LOCATION:	Lat. 54° 20′ Long. 120° 07′ (93I/8E) On Narraway River and Saxon Ridge, adjacent to the Alberta-British Columbia boundary.
LICENCES:	CL Nos. 1483 to 1535.
ACCESS:	By road from Grand Prairie, Alberta, a distance of approximately 80 miles.
OWNER:	Saxon Mines Ltd.
OPERATOR:	DENISON MINES LIMITED (Coal Division), 1660, 540 Fifth Avenue SW., Calgary, Alta.; D. M. Parkes, Chief Engineer; A. A. Johnson, Chief Geologist.
DESCRIPTION:	The prospect is situated in an area of moderate relief within the Lower Cretaceous belt of the eastern foothills. Four potentially economic seams occur above the basal marine sandstone of the Gates Member (Commotion Formation). These outcrop, and have strip-mining potential along the infaulted panels which form the northeast limb of the closely folded, broadly synclinal belt underlying the central and southwesterly parts of the licence group. Dips are in the order of 45 degrees within the area drilled.
WORK DONE:	Four adits, totalling 404 feet, were driven and bulk sampled. Five diamond-drill holes, totalling 5,772 feet, were completed, and revisions to geological mapping on 1 inch equals 1,000 feet were carried out. A trailer camp was established and 7.5 miles of access road was constructed. A maximum of 18 men was employed during 1972.
REFERENCE:	*B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 496.

DENISON MINES LIMITED (QUINTETTE PROJECT) (No. 165, Fig. D)

LOCATION:	Lat. 54° 55′ Long. 121° 03′ (93I/14E) Along the foothills front between Bullmoose Creek and Kinuseo Creek, about 60 miles south-southeast of Chetwynd.
LICENCES:	CL Nos. 1303 to 1427, 1887 to 1907, 2174 to 2191, 2464 to 2489, 2607 to 2669.
ACCESS:	By road from Dawson Creek, 115 miles; alternatively from Chetwynd by 65 miles of forest access and oil exploration road.
OWNER:	Quintette Coal Ltd. (joint venture agreement with World Resources Company).
OPERATOR:	DENISON MINES LIMITED (Coal Division), 1660, 540 Fifth Avenue SW., Calgary, Alta.; D. M. Parkes, Chief Engineer; A. A. Johnson, Chief Geologist.
DESCRIPTION:	The Quintette joint-venture project covers an extensive licence group straddling the coal-bearing Lower Cretaceous belt of the inner foothills,

extending some 15 miles both northwest and southeast of Murray River. Potentially economic seams which occur in the Upper Gething Formation and middle part of the Gates Member (Commotion Formation) underlie five main prospect areas of varying structural complexity: Babcock, Wolverine North, Five Cabin Syncline, Wolverine South, and Quintette. All coal is medium volatile bituminous, with excellent coking and cleaning characteristics. Reserves outlined to date indicate major underground and limited open-pit mining potential.

WORK DONE: An intensive contract drilling programme consisting of 23,013 feet diamond core, 339 feet rotary, and 1,200 feet percussion holes were sited on structural targets in the Babcock, Wolverine South, and Five Cabin Syncline prospect areas. Detailed surface and underground mapping was carried out, and six adits, totalling approximately 900 feet, were driven and bulk sampled. A maximum of 56 mine was employed, and accommodated at a trailer camp on the property.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, pp. 500, 501.

TECK CORPORATION LTD. (BULLMOOSÉ PROJECT) (No. 168, Fig. D)

LOCATION: Lat. 55° 09′ Long. 121° 25′ (93P/3W)
On the east slope of Bullmoose Mountain, astride Bullmoose Creek.

LICENCES: CL Nos. 1103 to 1152.

ACCESS: By the Gwillem-Marten Creek forest access road, approximately 55 miles south from Chetwynd.

OWNERS: Brameda Resources Ltd. and Teck Corporation Ltd.

OPERATOR: TECK CORPORATION LTD., 7th Floor, 1177 West Hastings Street, Vancouver 1; W. R. Bergey, Exploration Manager.

DESCRIPTION: Prospect covers the Lower Cretaceous outcrop belt underlying the Coalition Mining block which adjoins to the northwest. The Chamberlain, Skeeter, and Bird seams of the Upper Gething sequence occur on the south flank of Bullmoose Mountain within the broad comparatively undeformed northeast limb of the regional syncline. Chamberlain seam thickness is as much as 13 feet but is variable, and contains a number of splits. Other coal seams have been noted in the Gates Member of the Commotion Formation, but these have not been assessed.

WORK DONE: Four NQ-size diamond-drill holes, totalling 3,692 feet, were drilled on CL Nos. 1103, 1104, and 1110.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 502.

COALITION MINING LIMITED (No. 195, Fig. D)

LOCATION: Lat. 55° 14′ Long. 121° 38′ (93P/4E)
Sukunka River area, 36 miles south of Chetwynd, on the west slope of Bullmoose Mountain.

LICENCES: CL Nos. 1062 to 1066, 1069 to 1102, 1153, 1154.

ACCESS: By 36 miles of improved forest access road south from Chetwynd, along the east side of the Sukunka River.

OWNER: National Trust Company Limited.

OPERATOR: COALITION MINING LIMITED, 1103, 1177 West Hastings Street, Vancouver 1; N. E. Roberts, Operations Manager; J. Burns, Mine Manager; G. R. Jordan, Project Geologist.

DESCRIPTION:

The Coalition deposit occurs in high relief foothills terrain east of the Sukunka Valley. Two seams of medium volatile, low ash metallurgical coal occur in the Upper Gething sequence. The lower and upper seams, termed respectively 'Chamberlain' and 'Skeeter' each average about 8 feet in thickness and are separated from each other by some 20 to 40 feet of thin-bedded siltstone and laminite. Good seam continuity occurs throughout the area investigated.

Regionally, the prospective mine area lies in a mildly deformed block situated west of the Bullmoose fault complex, a zone of steeply dipping reverse faults and tightly compressed northwesterly trending folds. The prospective block has been cut into three broad plates by two main low-angle thrust faults of moderate displacement. Within each plate the strata are flat lying, or only mildly flexured; however, considerable slippage and small-scale thrust faulting are comparatively frequent, particularly near the top of the Chamberlain seam, and within the interseam sedimentary rocks.

Lack of seam partings, exceptionally low ash content, and good FSI values enhance the value of this coal for metallurgical purposes.

WORK DONE:

Coalition's 1972 programme emphasized detailed assessment of geological and underground mining conditions, and economic feasibility. Work concentrated on CL Nos. 1072 and 1073 included detailed mapping and contract drilling of 11 diamond-drill holes, totalling 9,029 feet. Comprehensive rework and evaluation of all data were completed by the consultants, C. McElroy and Associates.

A three-entry mine in the Chamberlain seam was commenced in September, and by year end had advanced 1,000 feet down-dip, with lineal drivage of some 3,766 feet. Major equipment used in the underground operation included one Lee Norse 105 continuous miner, one Noyes shuttlecar, a Fox 36-inch conveyor, a roof-bolting machine, and Fox auxilliary fans.

Surface construction consisted of establishing a 100-man trailer camp, a workshop, and generator building housing three Caterpillar 500-kva. generators. Land was cleared and prepared for the No. 1 minesite, preparation plant, coal storage area, conveyor, and transmission line. A mine water reservoir was completed, and the existing road from camp to minesite was upgraded; 1,500 feet of new road was constructed.

Twelve thousand tons of run-of-mine coal was shipped for testing purposes.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 501.

PAN OCEAN OIL LTD. **(No. 188, Fig. D)**

LOCATION: Lat. 55° 20' Long. 122° 00' (93O/9E)
Headwaters of Willow Creek and Johnson Creek, approximately 20 miles west-southwest of Chetwynd.

LICENCES: CL Nos. 2686 to 2752.

ACCESS: Via road from Chetwynd to Hasler-Willow Creek area.

OWNER: PAN OCEAN OIL LTD., 1050 Three Calgary Place, 355 Fourth Avenue SW., Calgary, Alta.

DESCRIPTION: Prospect occurs within a moderately to tightly folded and faulted belt of Gething Formation situated on the northeast limb of the Falls Mountain syncline. Medium volatile, metallurgical-grade coal occurs within the Gething in this general area.

WORK DONE: Reconnaissance geological field mapping in the autumn of 1972, to be supplemented by an initial drilling programme in 1973.

TEXACAL RESOURCES LTD. (No. 183, Fig. D)

By T. M. Waterland

LOCATION: Lat. 55° 50′ Long. 122° 20′ (93O/16W)
South of the Peace River, between Gething and Burnt Trail Creeks.

LICENCES: CL Nos. 2043 to 2054 and 2490 to 2513.

ACCESS: From the Bennett Dam by four-wheel-drive vehicle road to Dowling Creek, approximately 8 miles.

OWNERS: Bow River Resources Ltd. and Texacal Resources Ltd.

OPERATOR: TEXACAL RESOURCES LTD., 213, 475 Howe Street, Vancouver 1.

DESCRIPTION: Licences are situated within a broad shallow syncline, underlain by Bullhead and Fort St. John Groups. As many as seven coal seams, two of which exceed 5 feet in thickness, occur within the Gething Formation.

WORK DONE: In 1972 one diamond-drill hole was drilled to a depth of 1,828 feet on CL No. 2512.

CINNABAR PEAK MINES LTD. (No. 184, Fig. D)

LOCATION: Lat. 55° 56′ Long. 122° 08′ (93O/16E)
On Coalbed and Johnson Creeks, about 15 miles southwest of Hudson Hope.

LICENCES: CL Nos. 1019 to 1052 and 1155 to 1157.

ACCESS: By 10 miles of the Johnson Creek forest access road, westerly from the Chetwynd-Hudson Hope Highway at Mile 28.8.

OWNER: CINNABAR PEAK MINES LTD., 7203 – 81st Avenue, Edmonton, Alta.

DESCRIPTION: Coal seams occur within the Lower Cretaceous Gething Formation which attains a stratigraphic thickness of about 1,600 feet on both limbs and the southern end of a south plunging anticline. Twenty seams ranging from 1.5 feet to more than 8 feet are reported. Coal in the upper part of the formation, particularly in the Trojan and Superior seams, appear to be of coking quality.

WORK DONE: During 1972 a hammer seismic survey was conducted, and four diamond-drill holes totalling 1,059 feet were drilled on licences 1023, 1026, 1030, and 1035. The work was supervised by Halferdahl & Associates Ltd. of Edmonton.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 498.

UTAH MINES LTD. (CARBON CREEK PROJECT) (No. 186, Fig. D)

LOCATION: Lat. 55° 58' Long. 122° 43' (93O/15E)
Along the Carbon Creek drainage basin extending southeastwards from Williston Lake to Beattie Peaks.

LICENCES: CL Nos. 1736 to 1790, plus 10 Crown-granted lots.

ACCESS: By air from Chetwynd or Fort St. John, or by rail and barge from McKenzie, via Williston Lake.

OWNER: UTAH MINES LTD. (and BURNS FOUNDATION LTD.), 412, 510 West Hastings Street, Vancouver 2; D. S. Fullerton, district geologist.

DESCRIPTION: The Carbon Creek coal basin is a broad, comparatively simple, northwesterly trending syncline about 8 miles in width and 20 miles in length, contained within the more severely deformed *en echelon* fold belts of the inner foothills. The Lower Cretaceous Gething Formation, which attains a maximum thickness of some 1,300 feet, contains numerous thin coal zones, which vary laterally in thickness and quality. As many as 12 potentially economic zones, containing seams exceeding 4 feet in thickness, occur principally in the upper 900 feet of the Gething sequence. Structurally, the northern part of the basin is a shallow-dipping, southeasterly plunging syncline. This relatively simple configuration is progressively complicated to the southeast by subsidiary folds, and high-angle reverse faults.

WORK DONE: The 1972 programme was directed toward assessment of seam continuity and quality, principally in the central part of the prospect. Fourteen HQ (3-inch) core holes, totalling 9,296 feet, were completed by Longyear Drilling Co. Ltd. Proximate coal analyses were determined for 130 core samples. Fourteen miles of new access road and construction of three bridges were completed in the project area. Drill sites were reseeded upon termination of the programme.

REFERENCE: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1971, p. 500.

UTAH MINES LTD. (EAST MOUNT GETHING PROJECT) (No. 185, Fig. D)

By T. M. Waterland

LOCATION: Lat. 56° 03' Long. 122° 20' (94B/1W)
Situated on the east flank of Mount Gething, between Gaylord Creek and Lake Williston.

LICENCES: CL Nos. 1651 to 1678.

ACCESS: From Fort St. John by helicopter, a distance of 75 miles.

OWNER: UTAH MINES LTD., 412, 510 West Hastings Street, Vancouver 2; D. S. Fullerton, District Geologist.

DESCRIPTION: The prospect is located on the western limb of the northwesterly trending Dunbury syncline; dips in this area are in the range of 10 degrees to 25 degrees northeast. A number of relatively thin medium-volatile bituminous coal seams occur in the Gething Formation, which attains a thickness in excess of 1,500 feet.

WORK DONE: Two HQ-size core holes totalling 1,474 feet were completed during 1972.

BULKLEY VALLEY COLLIERIES LTD. (No. 187, Fig. D)

By W. G. Clarke

LOCATION: Lat. 54° 35′ Long. 127° 10′ (93L/11E)
On Goathorn Creek, 7 miles southwest of Telkwa.

LICENCES: CL Nos. 164, 443 to 448, 522 to 527, 561 to 563, and 643 to 646, plus six Crown-granted lots.

ACCESS: By gravel road from Telkwa.

OWNER: Bulkley Valley Collieries Ltd.

OPERATOR: BULKLEY VALLEY COAL SALES LTD., Box 39, Telkwa; Lloyd Gething, Manager.

WORK DONE: In 1972 all coal production was from small pits on the west bank of Goathorn Creek upstream from the preparation plant. Mining continued in the South Prospect pit, from the fall of 1970 until June, 1972; 283 tons of this coal was sold in 1972. Two sidehill pits were opened near the No. 4 entry during the summer and 193 tons of coal was mined from these by the end of the year. This completed the removal of reserves available for strip mining. A total of 476 tons of coal was mined and sold on the local market. As this was insufficient to supply local demand, increased production is planned for 1973. Two men were employed part time.

REFERENCES: *Minister of Mines, B.C.*, Ann. Rept., 1951, pp. 291-197; 1967, pp. 458, 459; *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1969, p. 422; 1970, p. 529; 1971, p. 497.

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